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Two of the most successful regional educational data processing centers in Iowa are analyzed to provide information for future efforts to develop educational information systems. Objectives of the system and its scope of operation are determined. Then hardware/software necessary to achieve these goals is specified, along with an estimated budget for purchase and upkeep. The educational requirements and job responsibilities of the staff members are outlined. Some of the possible applications for the system are listed and the need for disseminating such information to clients is pointed out. Although clients may need some individual attention to specific problems, it is recommended that all participating schools should run on one set of programs. Evaluation--either general, structural, operational, and/or financial--should be made periodically or for a specific purpose. A basic glossary to data processing terms is included. The appendix contains samples of forms used by the two successful centers. (JY)

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FINAL REPORT
PROJECT NO. 6-1502
CONTRACT NO. OEC 3-6-061502-0429

DATA PROCESSING IN EDUCATION: STATE AND REGIONAL CENTERS

PRINCIPAL INVESTIGATOR:
DR. W. J. FOLEY

U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
OFFICE OF EDUCATION
BUREAU OF RESEARCH

IOWA EDUCATIONAL INFORMATION CENTER
IOWA CITY, IOWA

EDU 29518

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East Hall Annex, The University of Iowa
Iowa City, Iowa 52240
January, 1969

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We are grateful to:

Iowa Area IX ALPINE Center

Iowa Area XI ACCESS Center

Educational Research and Development Council of the Twin Cities Metropolitan Area: "Total Information for Education Systems"

General Learning Corporation: "A Feasibility Study of the Central Computer Facility for an Educational System"

Nick Zarkos
Monte Kloberdanz

FOREWARD

A request for an extension of a developmental program funded by the U. S. Office of Education was submitted by the Iowa Educational Information Center in August of 1967.

The major activity of the extension proposal centered upon the analysis of developed programs at the state and regional levels.

This particular summary relates to the structure of state and regional Educational Data Processing Centers - that is, the systems objectives, the patterns of planning, implementation, budgeting, evaluation, and future plans.

The best features of Iowa's similarly structured Centers are presented and/or analyzed resulting in, what we feel is, a summary which will prove invaluable in future efforts to develop educational information systems for planning purposes.

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PURPOSE AND PHILOSOPHY OF PROJECT

In the original proposal it was intended that an analysis be made of Iowa's two most successful regional Data Processing Centers. However, after studying the organization and activities of these Centers it was found that they were so similar in all respects that they could best be analyzed as one.

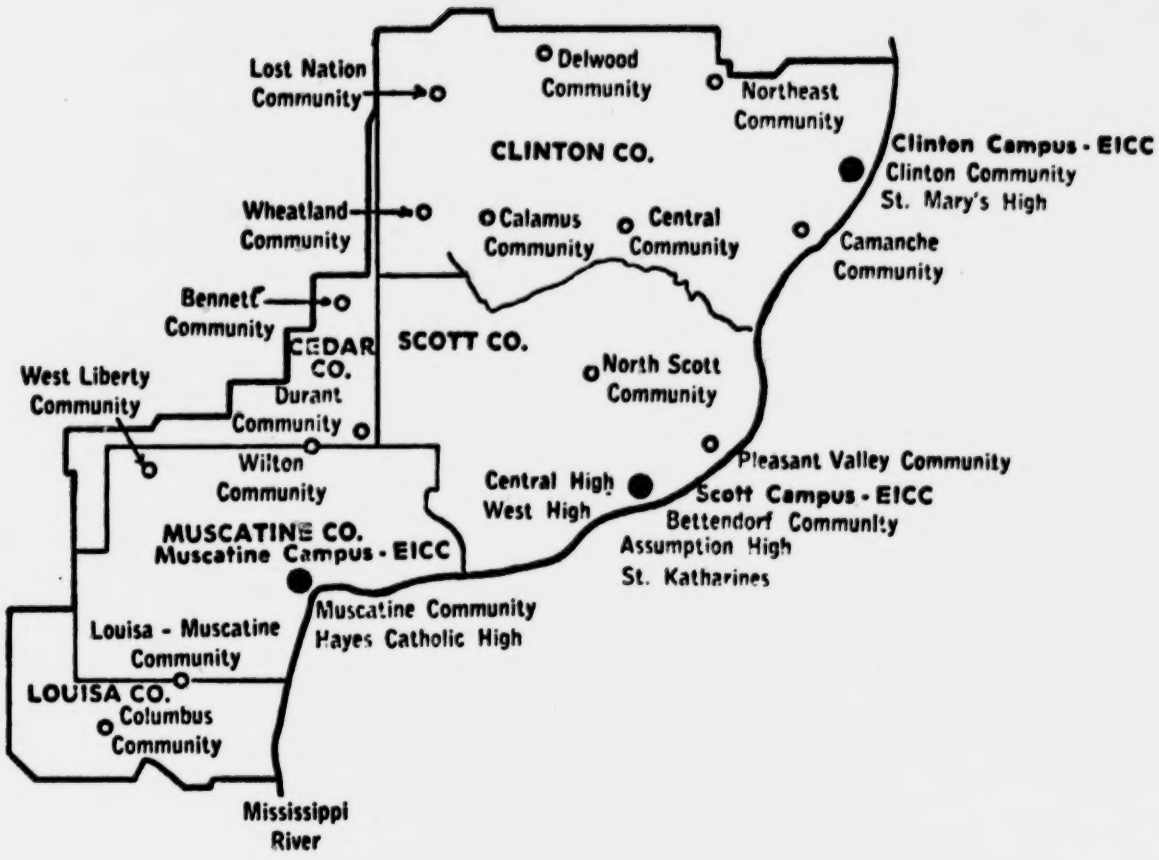
Therefore, the nature of this summary follows the philosophy of interspersing ideas and improving upon, where possible, one good system. The functional components and objectives of the two developed centers are analyzed but not compared.

ALPINE CENTER FACILITIES DESCRIPTION

The Schools Information Center (Area IX) is located in the Alpine Centre, Ltd., a new business complex on Highway 6 in Bettendorf, Iowa. Access to the area is very easy. It is sixty-five miles from the Center to the most distant area school.

The Center occupies 4,000 square feet of space on the second floor. In Suite 8 are located the offices of the project director and his staff, and the reception area. The conference area is in Suite 7, while the programming staff uses Suite 3. Ample storage space for active and inactive files and materials is available to all suites. All facilities are heated, lighted, and air-conditioned with the latest engineering advances.

GRAPHIC LIMITS OF ALPINE AREA IX

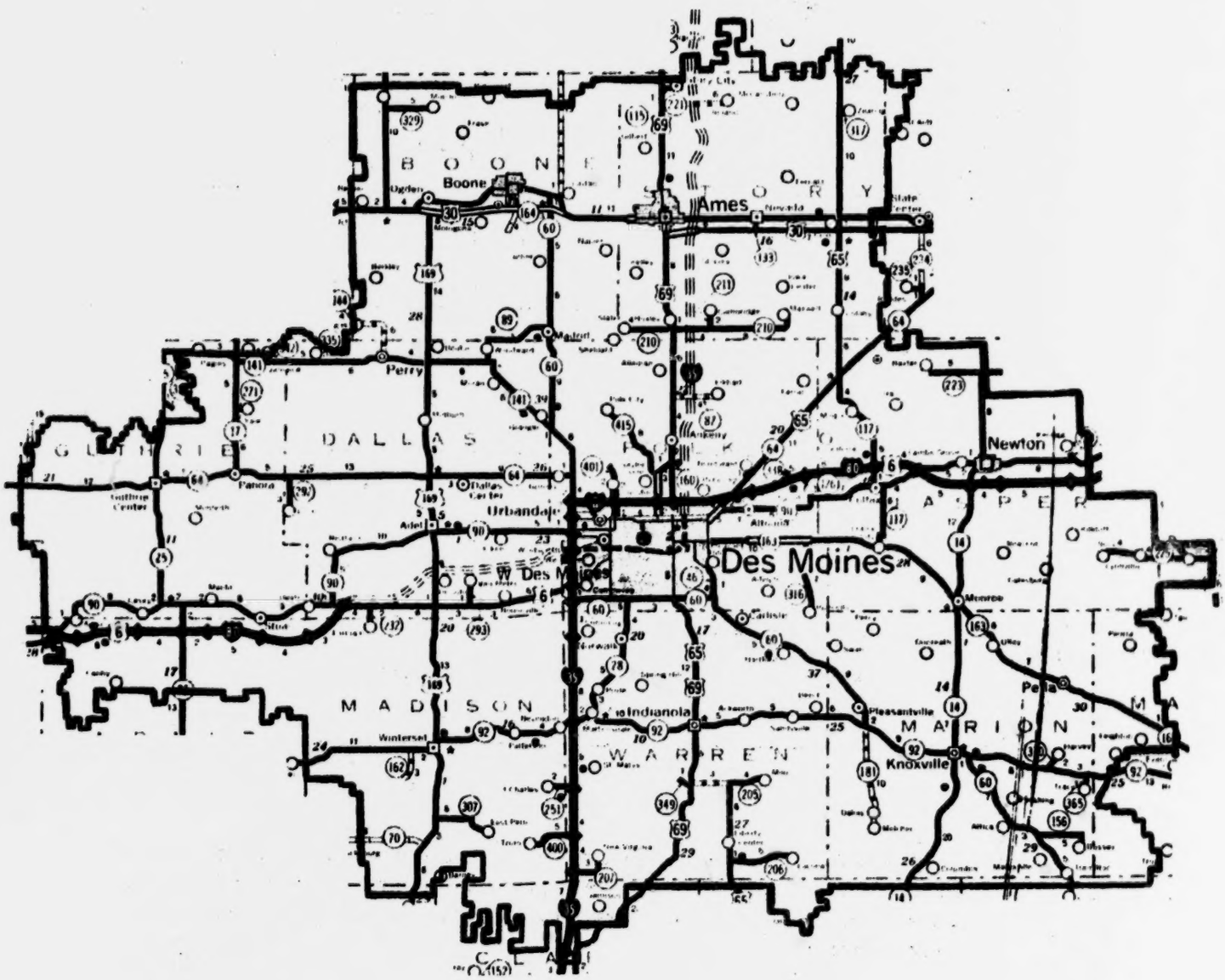


ACCESS CENTER FACILITIES DESCRIPTION

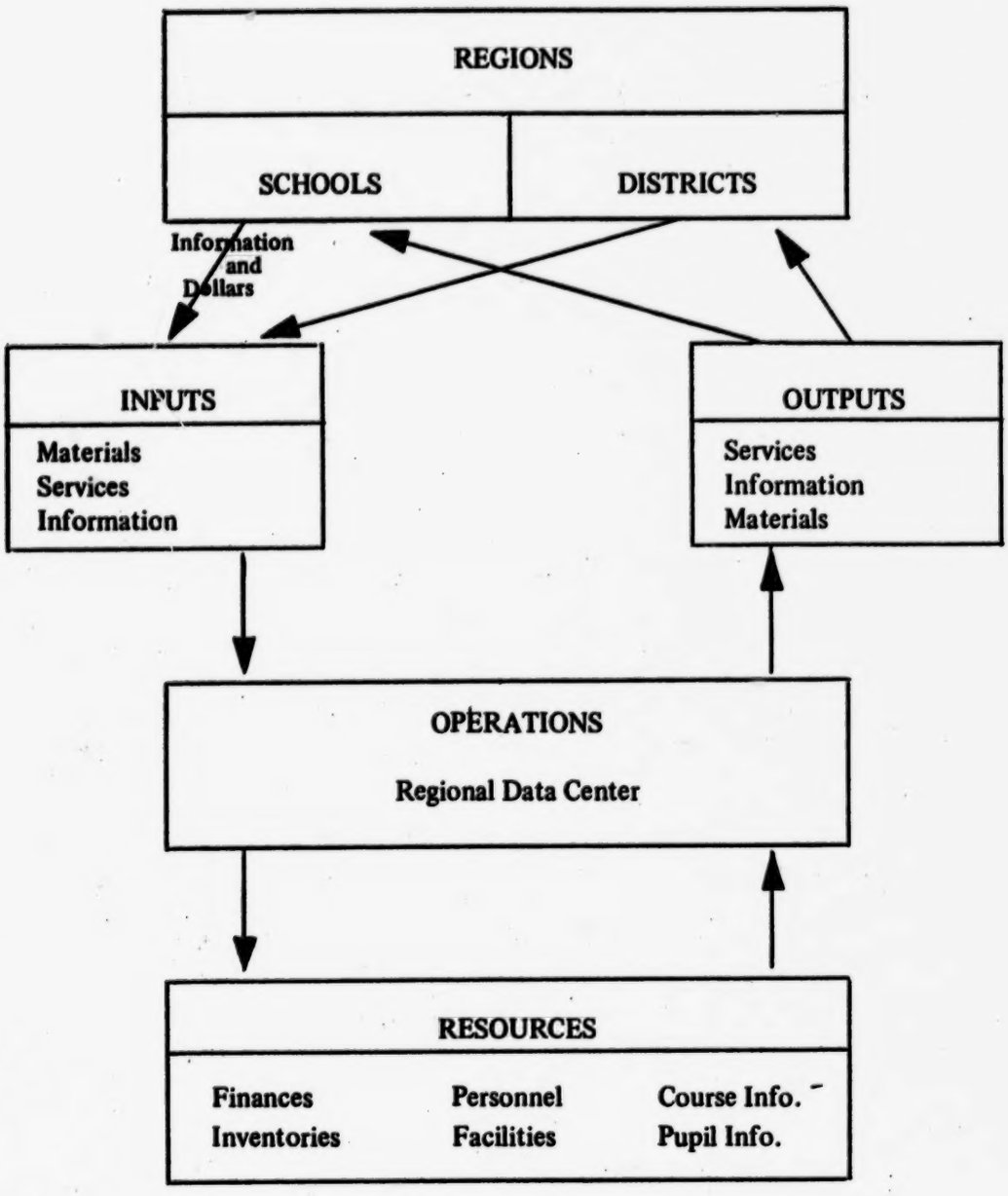
The ACCESS Data Center is housed in the Polk County Board of Education offices at 112-116 Eleventh Street, Des Moines, Iowa. The Polk County Board of Education occupies two floors of a six-story building at this location and the total area involves 18,000 square feet. The data processing equipment area occupies separate space on the first floor consisting of 1,025 square feet. This room is devoted entirely to the housing of the electronic equipment and is self-contained, fully carpeted, has been completely redecorated and relighted, and is under full air conditioning and humidity control. The operations supervisor has her office and desk in this space.

The project director, project coordinator, and all other coordinators and programmers have office space, desk space, secretarial service, and filing space on the first floor. The operation is fully supported by printing facilities and additional staff services from other members of the Polk County Board of Education staff.

GRAPHIC LIMITS OF ACCESS AREA XI



STRUCTURAL MODEL*



* Simplified model of a Regional Center illustrating the interaction of its various elements. Materials, services and information flow in from facilities outside the center. Resources are called upon by the Data Center operations to produce services and information for the outside facilities.

SCOPE OF THE PROJECT

This summary includes detailed information on organization, equipment, configurations, implementation, personnel requirements, budget considerations and those charts, formats, and designs pertinent to planning activities.

The structural analysis of the Centers is descriptive in nature.

Following is a complete narrative of the organization including relationships to other agencies, contracting procedures, scope of involvement and operational procedures. Individual program elements within the system are described separately where necessary.

Equipment configurations are described in detail, i.e. the type of hardware components and software packages necessary for the most efficient functioning.

Implementation steps are flowed where applicable. A descriptive presentation of necessary steps and time estimates is included as needed.

Personnel requirements include job descriptions, titles and desired qualifications for staff members. Presented in a time sequence, we have recommended who to hire, when, and for how much.

A detailed budget based upon Center experience is recommended. This has been arrived at through pupil population analysis for each program element by the Centers. Costs are related to output, priorities established and sources of revenue estimated. Funding methods in general have been discussed in this section of the report.

Input documents, information requirements, processing procedures and output are summarized in the report. Also included are vital flowcharts, file designs and formats with accompanying brief descriptions. Actual documents are included in the appendices. This information should be very helpful for those administrators responsible for planning a Center.

In addition to the above descriptive data the objectives of the Centers are analyzed. That is, are the benefits of the service being maximized? What other alternatives do we have? What are the governing factors in relationship to a successful payable Center?

STARTING A STUDY

Before any study regarding the creation of an Educational Data Processing Center is embarked upon there must be an organization of responsibilities and purpose. The broad objectives must be set and must be met. To begin with, a big picture model is needed. As specific areas of application are sought out the following should be considered:

1. Should we be administratively oriented or student oriented? Although it is very desirable to be student oriented, perhaps it is better to start at the administrative end. Applications are easier to define, are more easily formulated, and can be accomplished sooner. This is not to say that they are not worthwhile and/or desirable applications, but only that a Center can begin producing results sooner on a more concrete base.

   Also, support is to be considered favorably for the administrative oriented approach. Offering benefits to those who must approve and contribute to developmental activities is good sense for getting a good start.

2. Scope of services. Where do you start and how far do you go in the initial plan?

3. Background. How were things done in the past? How are they done now? What could not be done at all that we feel we need? We must consider the background and needs prior to embarking in any direction.

4. Offering dates of services. For when do we promise services? How do we set dates? Are they realistic? Goals must be set and made for initial services.

5. Staff characteristics. What kind of a staff will be needed? What kind of an administrator will

you need? What kind of training will they all need? Determine ratio of D.P. staff and non D.P. staff needed and set responsibility levels. There must be a proper mix for a cooperative effort.

6. Hardware/software characteristics. Be familiar enough with this area to know generally what you need and from what sources you can get it. The systems must dictate the hardware type and you, not the manufacturer, must dictate the hardware make. This is one area in which it is absolutely necessary to have a skilled data processing specialist working hand in hand with a skilled educational specialist.

7. Expense and financing. Have a good idea of your proposed expenses and where the money is coming from. Don't plan too ambitiously in relationship to your budget and probable income. Schedule your spending and do not deviate from or mix budget items. This can easily escape you.

8. Evaluation. Have some idea of evaluating progress and results. PERT will be helpful towards progress evaluation, but results must be evaluated by tangible and/or intangible measures depending upon the application.

EVENT CHART

For those contemplating the creation of a regional center, we suggest that one of your first orders of business should be that of creating an Event Chart. This may or may not be followed by a more detailed PERT chart. Such charting is valuable to any project, even if the schedules are not at all workable, in that they can:

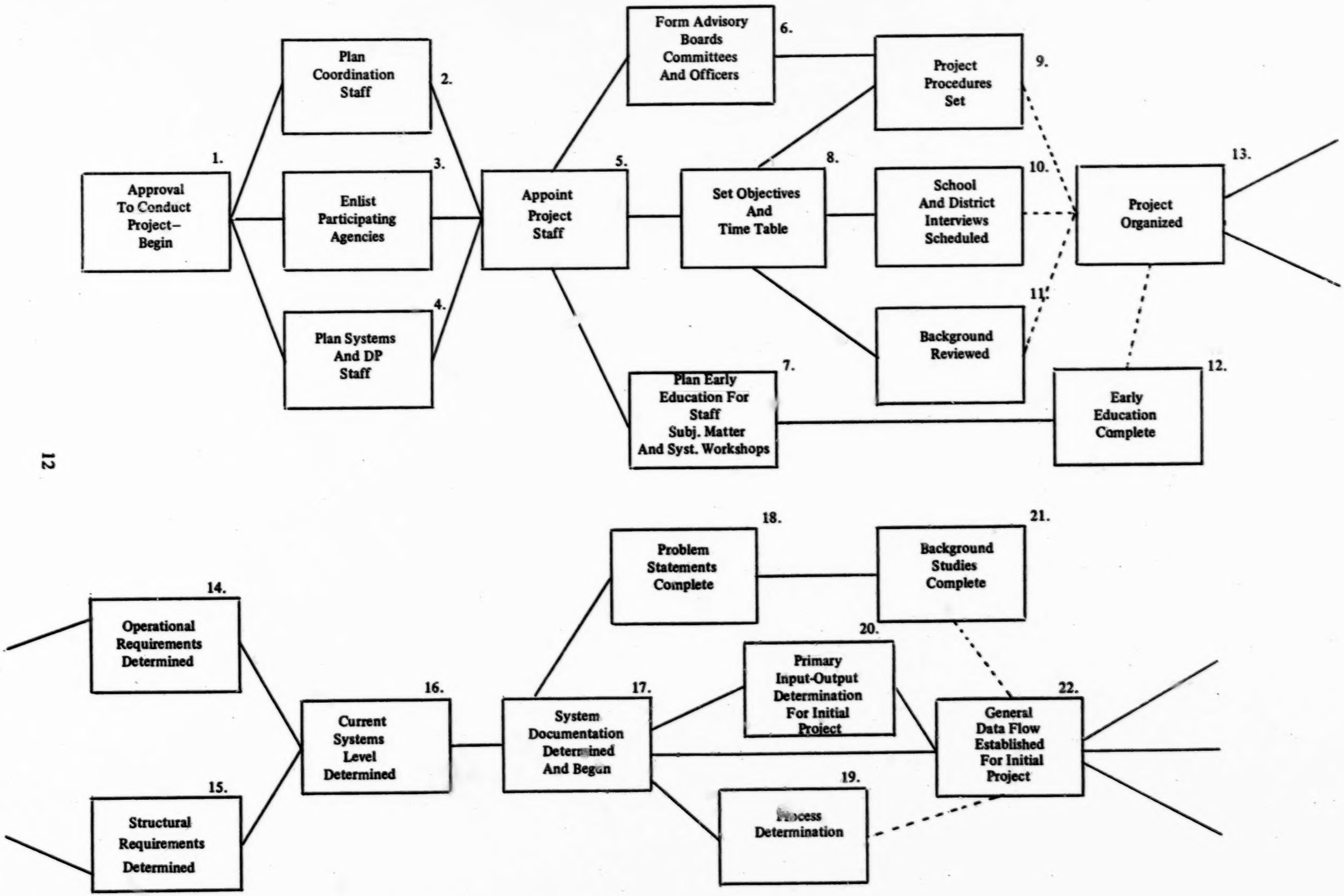
1. Provide a chart of events.

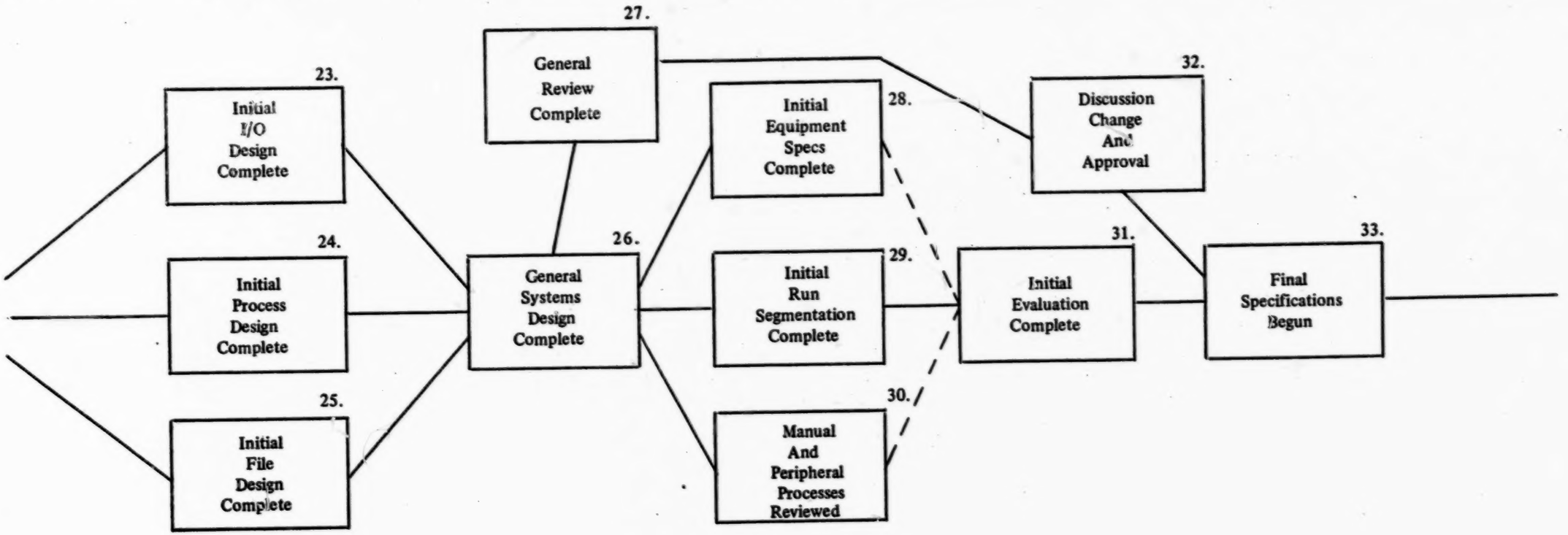
2. Force planning.

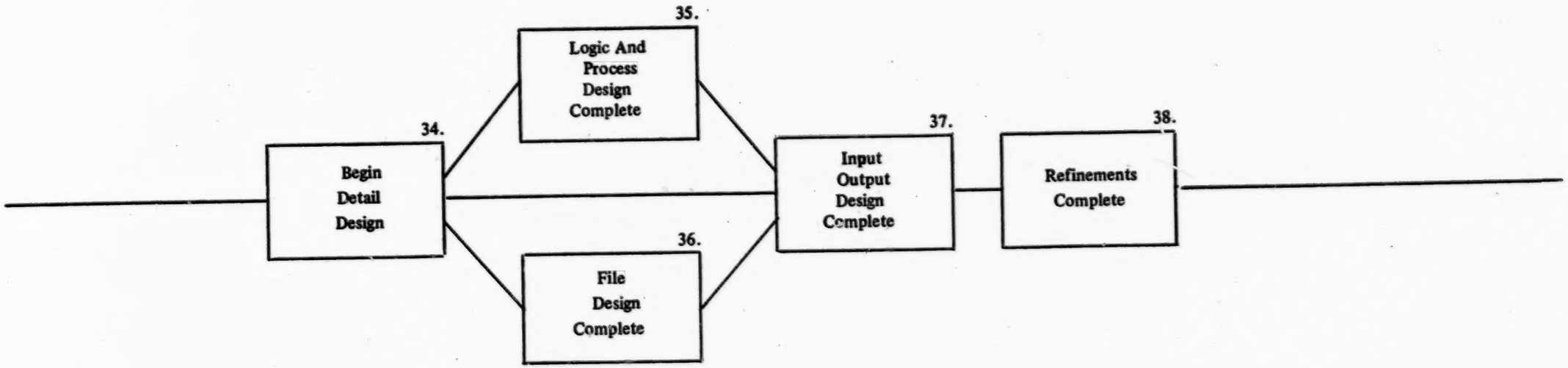
3. Pinpoint critical areas.

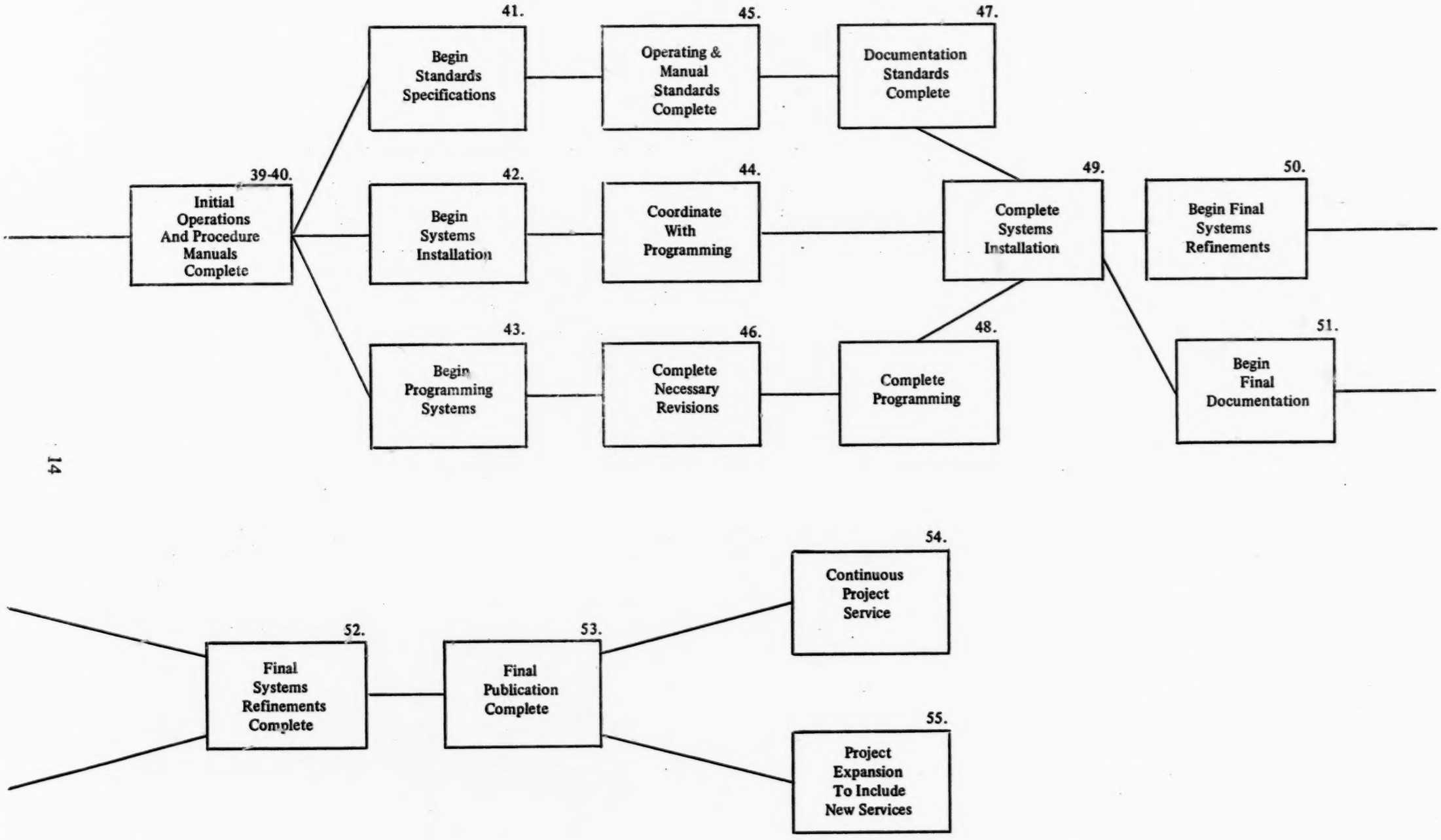
4. Force management decisions.

An Event Chart covering a Regional Data Center from its approval or beginning on through the first major project program accomplishment might look as follows:


1.
Approval To Conduct Project– Begin
2.
Plan Coordination Staff
3.
Enlist Participating Agencies
4.
Plan Systems And DP Staff
5.
Appoint Project Staff
6.
Form Advisory Boards Committees And Officers
7.
Plan Early Education For Staff Subj. Matter And Syst. Workshops
8.
Set Objectives And Time Table
9.
Project Procedures Set
10.
School And District Interviews Scheduled
11.
Background Reviewed
12.
Early Education Complete
13.
Project Organized
14.
Operational Requirements Determined
15.
Structural Requirements Determined
16.
Current Systems Level Determined
17.
System Documentation Determined And Begun
18.
Problem Statements Complete
19.
Process Determination
20.
Primary Input-Output Determination For Initial Project
21.
Background Studies Complete
22.
General Data Flow Established For Initial Project


27.
General Review Complete
23.
Initial I/O Design Complete
24.
Initial Process Design Complete
25.
Initial File Design Complete
26.
General Systems Design Complete
28.
Initial Equipment Specs Complete
29.
Initial Run Segmentation Complete
30.
Manual And Peripheral Processes Reviewed
32.
Discussion Change And Approval
31.
Initial Evaluation Complete
33.
Final Specifications Begun


35.
Logic And Process Design Complete
34.
Begin Detail Design
36.
File Design Complete
37.
Input Output Design Complete
38.
Refinements Complete



NOTE:
Implementation Begins Before Standards And Design Are Complete.

PLANNING

It is essential at the outset of the area center planning to appoint an advisory committee to represent and offer advice and encouragement. This committee should include school personnel able to identify and resolve educational needs, data processing manufacturers and service contractors able to translate school needs into technical requirements and equipment capabilities, and business and school executives who are users or providers of educational data processing. These people must be chosen with their indication that they will continue committee consultation when the center is operational.

A special effort should be made to personally contact school personnel while on the job. The Project Director and the area coordinator should meet with each county board of education to explain in detail the operation and services of the center. The county boards should be informed of their projected need for budgeting funds for yearly operations. At such meetings, the Center's proposed budgets and services should be explored in depth.

Further, a pilot study involving several area schools could be conducted in an effort to determine data processing utilization and needs of each school. For example, a questionnaire could be developed and distributed to all area schools. The schools would be asked to examine prospective educational data processing services and, with their individual needs in mind, to rate each of the proposed services as it would be most beneficial to them. The questionnaires would present a detailed outline of the various functions to be provided by the Center.

In addition to the interview and questionnaire data collection, the planning staff could conduct a series of in-service question/answer seminars. Here the whole data processing project would be explained and specific areas studies. Educational data processing experts should be in attendance to answer questions.

Proceeding simultaneously with the above activities, the center staff should contact and study commercial data centers currently providing data processing services to area or nearby school systems. It is advisable that visits to and consultation

with various established data processing centers on the national level also be carried out. Continued contact with representatives of these organizations and state and federal department of Education is essential so as to keep abreast of all data processing developments affecting schools. It is imperative that there be continued objective criticism both during and after the planning phase by a completely separate, objective observer.

There should be planning for project control, systems/programming personnel schedule, and activity schedule. The Critical Path Method (CPM) can be implemented for subsystem network and schedule development. Estimating man months and number of personnel is necessary here.

Future Financial Planning

Initial financial support for the Center's planning phase could be obtained through an ESEA, Title III grant upon proper and accepted application. This would provide a totally integrated system of data processing services for the participating districts and their pupils. These monies would provide initial staff services including the leasing of supporting equipment and hardware. While these monies would be used to support the total program, they would not be the exclusive monies applied to the Center project. Participating districts would contribute an increasing percentage of the funds needed to develop and maintain the project as it evolves during the first three operating years. The allocation of Federal Support should be planned so as to terminate at the end of the first three years. The entire cost of the operation would then be assumed by the participating member districts, possibly through, for example, a one-half mill levy spread over the whole area. Further financial support would be provided on a per pupil basis for such Center services as Scheduling and Grade and Attendance Reporting and for development of such. These fees would necessarily increase so that full financial responsibility would be assumed at the end of the three year period.

Planning Procedures

In summary, then, Iowa's regional data processing Centers were conceived and developed by completing the following procedures:

1. Planned at county level.

2. Enlisted services of an advisory committee.

3. Decided on potential areas of usage.

4. Decided on nature of programs necessary.

5. Estimated expected benefits.

6. Obtained Federal Grant through HEW for planning, development and operation.

7. Developed organization and staff.

8. Made use of advisory groups from education and industry. Used consultants, organizations, higher education individuals and groups and existing Centers at other locations for aid and evaluation.

9. Developed operational requirements.

10. Assigned priorities to applications.

11. Defined and developed systems requirements.

12. Gathered needed information.

13. Planned equipment utilization.

14. Decided upon equipment specifications.

15. Decided upon software specifications.

16. Trained staff.

17. Operation and maintenance guidelines.

18. Developed master plan and budget utilization for period through implementation.

19. Kept people informed through periodic reporting and good documentation.

20. Determined methods of evaluation and evaluated.

OBJECTIVES

Among the major, more immediate, or minimum objectives of an Area Processing Center, the following are most pertinent:

A. To develop an Educational Data Processing System devoted to the unique needs of elementary and secondary education for the area.

B. To provide outstanding dissemination of information among schools.

C. To provide teachers and administrators with proper computer training.

D. To assist teachers in applying the computer as a teaching-learning device in various curriculum areas.

E. To assist administrators in the application of data processing techniques to educational administrative functions.

F. To provide pupils with facilities to apply new knowledge and skill in computer science and to engage in new learning experience.

G. To provide school personnel with the information and resources for better interaction with pupils and for the development of new instructional techniques.

H. To provide specialized computer services in:

(1) Business office and other teacher personnel
(2) Student personnel
(3) Attendance and Census
(4) Instructional uses

As the Area Center germinates and grows, more long-range objectives will follow. These should include:

1. Improved dissemination of information.

2. Timely and accurate preparation of reports and information.

3. Ability to prepare reports not previously possible.

4. Savings in manual effort by school and center staffs.

5. Improvement of educational research through data processing.

6. Coordinate educational data processing efforts with other agencies and comparable centers attempting

   a. To meet the needs for information
   b. To avoid duplication, and
   c. To share in common the strength of the individual agencies.

7. Avoid technological obsolescence through cooperation with other agencies and centers.

8. Develop methods to integrate the use of computers as an instructional tool in any curriculum area.

9. Establish a broad base of information to be made available for the analysis of common area center problems.

10. Instruct pupils in the impact of the computer on our society, in the languages used, and in the career opportunities in data processing.

11. Implement in-service programs for school personnel.

12. Demonstrate the management and operation of a data processing center.

13. Utilize greater capability of equipment at less expense through cooperation.

14. Develop new means of instruction through data processing.

15. Maintain staff members and consultants of the highest competence and utilize them in the development and realization of long-range systems planning.

A self evaluation of Iowa's centers to date could be summarized as follows:

The rapport of the personnel is good; quick and efficient service has pleased customers; creative thinking and exploration has prevailed; equipment used is the latest on the market and staff members are afforded every opportunity to further themselves personally and professionally. All of these add up to a job well done and the expectation that immediate and future objectives will be met with equal success. It would be well for starting centers to consider the above mentioned as a critical operational objective.

Several further areas of concern for future planning must be considered:

1. A stabilization of the future funding necessary to the Center's operation.

2. An increase in the Center's in-service and public relations activities.

3. Emphasis on the information requirements for long-range planning for the participating school districts.

4. A continual expansion of staff and facilities to better meet the objectives of the Area.

5. Clarification of the role and responsibility of advisory committees.

OPERATIONS

A consulting committee composed of local business, industry and government leaders should be established to aid in designing and developing various administrative information systems. The Center should work closely with the State Department of Education, universities and other Regional Data Processing Centers to coordinate developmental activities.

A policy committee with a representative from each county board should be formed. This committee would determine policy guidelines for the Center's operation.

A coordinating committee, made up of local school district administrators, should be formed to define specific data needs, assign priorities for developmental activities, assist with field testing of new services, and aid in execution and evaluation of the entire program.

Documented operating procedures, an operating manual, and job-scheduling procedures should be established at the outset and not during the evolution stage of development.

Technical and professional educational personnel should work with local classroom teachers in different curriculum areas to develop units of instruction centered around use of the computer by students to acquire knowledges and skills in the respective subject fields. Computer Assisted Instruction should be another area of application. Developmental effort in administrative data processing could also be conducted.

In a study completed in February, 1968, the General Learning Corporation presented the following guidelines for achieving the benefits of data processing at lower cost through centralized systems and program development work:

a. Pluralistic systems development, allowing for a high degree of flexibility where this may be valuable, yet providing for comparable data and readily available computer programs and school procedures for most situations.

b. Requiring vendors wishing to do business with schools to guarantee implementation of computer programs within the above framework in a reasonably efficient way on their machines.

c. Bring school administrators to a higher level of understanding about computers and data processing, so that decisions affecting both a centralizing development effort and the impact of data processing in the local situation could be made appropriately.

d. Developing guidelines for schools to do those parts of their own systems analysis work necessary for the effective functioning of administrative data processing regardless of where the systems, computer programs, and procedures were developed.

e. Guaranteeing that centralized systems and program development would not be used as a tool of political control, and would serve the schools as well as various government and other agencies.

It is one thing to list what "should be"; it is another thing to operate a Center. Local differences and laws varying from state to state must be considered. Also, machine configuration discrepancies and variations in programming language must be accounted for.

Emphasis should always be on the adaptation of techniques and technology from business, industry, government and other educational agencies. The entire project should be devoted to development and implementation of innovative instructional and administrative services using advanced computer technology.

PERSONNEL REQUIREMENTS

The personnel requirements are grouped into five different categories as follows:

1. Administration
2. Staff Consultants
3. Systems/Programming
4. Operations
5. Services/Conversion

It should be understood that educational attainments specified are minimums.

A. Administration

1. Project Director or Director of Education Services

a. Education, training and experience:

This individual should have a Master's degree and a Doctorate is highly desirable. He should have ten or more years work experience in progressively responsible positions in school administration. It is highly desirable to have three or more years experience in the utilization of data processing systems and procedures in educational institutions. He should have directed others in the planning and implementation of multiple data processing services. He should be an individual who has demonstrated skills in working with multiple school districts in cooperative education ventures. In his prior capacities he should have a record for innovation and have demonstrated leadership skills in stimulating others.

b. Responsibilities:

(1) Policy. He would initiate and administer policy appropriate to the internal staff. When appropriate, he would recommend policy to those to whom he is responsible. He would make recommendations for facilities and equipment procurement and for staff appointments.

(2) Objectives. He would have over-all responsibility for the formulation of objectives as represented in a detailed plan. This would include the preparation of necessary reports and records, the establishment of dates for the initiation and completion of various tasks, and the performance of other such administrative duties as required in the initial, developmental and operational phases of the project.

(3) Finance. He would have the responsibility for developing and recommending budgets of income and expense periodically and presenting such to those to whom he is responsible. He would be responsible for meeting the objectives set forth in the budget.

(4) Personnel. He would have responsibility for the recruitment, retention, supervision, development, termination, and compensation of all staff personnel.

2. Technical or Assistant Director of Education Services

a. Qualifications. This individual should have a Master's Degree or Doctorate with five or more years work experience in school administration, and three or more years work experience in supervision or use of data processing equipment. Work experience of five years or more in business, industry, or government positions of management

and operational responsibilities is highly desirable. He must have completed formal instruction and on-the-job training in the use of automatic and electronic data processing equipment. He should have demonstrated by previous responsibility, his capacity to direct the activities of others, including both systems/programming and operational personnel. He should also have an understanding of, or demonstrated capability to quickly grasp, the problems and environment of education. His skills and background should tend to complement those of the Project Director.

b. Responsibilities:

(1) Objectives. He should assist in formulating the objectives of all those persons under his direction and review their progress with respect to fulfilling the objectives. He should plan, develop and operate information systems projects in the application of data processing procedures and equipment to educational problems in public and private schools.

(2) Appraisal. He should appraise the performance of individuals reporting directly to him for subsequent review by the director. He should review the personnel appraisals made by his subordinate personnel.

(3) Communication and Coordination. He should see that all personnel under his direction adequately communicate with each other as appropriate. He should plan the operations and supervise the staff of the data center and to do the other work as required in the initial, developmental and operational phases of the project.

B. Staff Consultants

3. Area Coordinator and Consultant

a. Qualifications. Master's Degree in education or mathematics education or business education with five or more years work experience in school administration. He should have experience in a supervisory capacity including demonstrated leadership skills in group situations. He should have appropriate training in the technical aspects of data processing, including computer and punch card equipment. He should have experience in programming with assembly languages such as Autocoder, Easycoder, or Cobol. He should have three years experience as principal or superintendent while utilizing educational data processing services.

b. Responsibilities:

(1) To direct the development and implementation of the data processing center systems project developed for students and staff members from participating schools.

(2) To develop, coordinate, and conduct in-service training, workshops and conferences for school personnel for the implementation of new programs.

(3) To develop contracts with resource persons from colleges and universities, schools, businesses, etc., for the benefit of the center.

(4) To establish and maintain a library in educational data processing methods, systems and equipment.

(5) To act as a liaison agent to all agencies interested in or connected with operation of the center.

(6) To serve as consultant in educational data processing to individual staff members, committees and boards of education.

C. Systems/Programming

4. Information Systems Coordinator

a. Qualifications:

(1) A Master's Degree in mathematics or science.

(2) He should have at least four years experience in the technical aspects of electronic data processing including systems analysis, design and development, teleprocessing, adopting computers to a classroom environment, and experience in Fortran or allied language.

(3) He should be able to demonstrate some innovative use of the computer in the mathematics curriculum at the secondary level.

b. Responsibilities:

(1) To coordinate planning, developing, and operating phases to complete projects with maximum balance of planning and equipment time, man hours and expenditures.

(2) To prepare the following:

(a) Project feasibility and progress reports.

(b) Recommendations which will establish and maintain the proposed curriculum.

(c) Survey on existing computer resources which might be utilized to establish and maintain the projected program(s).

(3) To develop contacts with various persons to act as resource persons to the center. These persons could be associated with industry, colleges, universities, professional organizations, etc.

(4) To confer with school administrators and teachers to define use, content and format of input and output data.

(5) To schedule and assign duties to systems manager, programmers and operating personnel.

(6) To coordinate activities of staff performing successive phases of problem analysis, solution outline, detailing, program coding, testing and debugging.

(7) To review output data to insure adherence to standards.

(8) To direct revision of systems to new data requirements or to improve operations of using new techniques or equipment.

5. Systems/Programming Manager

a. Qualifications. He should have a Bachelor's Degree. He should have prior experience as a system/programming manager or assistant or have otherwise demonstrated his supervisory skills with systems/programming personnel.

b. Responsibilities:

(1) Policy. He should initiate policy where appropriate and administer all policy relating to his area of responsibility.

(2) Objectives. He should assist personnel under his direction in formulating objectives and where appropriate establish objectives for those under his jurisdiction.

(3) Coordination. He should make certain that all personnel under his direction adequately coordinate their activities with other appropriate parties.

6. Systems Analyst

a. Qualifications. An individual in this capacity should have a Bachelor's Degree or post high school technical training. He should have three years of supervisory and procedures experience in electronic data processing with at least one year of experience in construction, development and installation of data processing systems. He should have demonstrated in prior employment above average analytical skills, a capacity to work and communicate easily with a wide variety of personnel, a good understanding of hardware and software, and the ability to develop adequate documentation with respect to his work. He should have a capacity to communicate in writing. He should also previously have demonstrated the ability to supervise programmers under his jurisdiction.

b. Responsibilities:

(1) General. Under the direction of the information systems coordinator and the systems manager, he should analyze educational data processing problems to convert them to programmable form.

(2) Supervision. He should supervise the programmers under his jurisdiction and develop jointly with them a definition of their responsibilities.

(3) Objectives. He should formulate the written objectives with respect to his area of information system responsibility, and review these plans and their fulfillment periodically with his supervisor.

(4) Coordination. He should maintain adequate communication with all other persons working on information systems having some relationship to his and assure that personnel under his direction are communicating adequately with each other in this same connection.

(5) Appraisal. He should periodically appraise the performance of personnel under his direction and make recommendations to his immediate supervisor.

(6) Design and documentation. Through contact with school personnel, he should formulate the system, sub-system and application design for those areas under his responsibility. He should create the necessary documentation to explain the proposed design of systems, sub-systems and applications to school personnel and to obtain their approval of the design. Documentation should also be adequate so as to provide the necessary data to programming personnel under his direction.

(7) Specifics. He should confer with operating personnel to devise plans for obtaining and standardizing input and output data. He should develop new systems and procedures in workflow sequence. He should analyze alternative means of deriving input data to recommend the most feasible and economical methods. He should develop flow charts in outlined and detailed form for programming and indicate verification points. He should assist in preparation of programs and in design of card and report forms. He should develop manuals of operation and assist in installation of procedures and systems and training of personnel.

7. Senior Programmer

a. Qualifications. He should be a graduate of a technical school or college with a minimum of one years experience with programming systems involving tape or direct-access oriented hardware and medium or large size computers or complex projects. He should have demonstrated above average capabilities in his prior employment as a programmer. He should have one years supervisory experience in a data processing installation.

b. Responsibilities:

(1) General. Under general direction of the information system coordinator, he should plan, schedule and direct preparation of programs to process educational data by electronic data processing equipment.

(2) Objectives. He should formulate objectives with his immediate supervisor and review progress in meeting these objectives with him periodically.

(3) Design and Coding. Utilizing the documentation supplied him by the systems analyst, he should clarify program intent, procedures, changes, coding and debugging techniques, and undertake any detailed design work that may be necessary to place his programs in operational status.

(4) Documentation. He should compile adequate documentation of his program development and revisions so that communication with systems and operational personnel is satisfactory.

(5) Coordination. He should communicate adequately with other staff personnel to insure a proper interface between his programs

and others that may have to interface with it.

(6) In-service education. He should perform whatever in-service activities are deemed appropriate by the systems analyst.

(7) Specifics. He should assign, coordinate and review work of programmers. He should develop his own programs and routines for difficult and complex educational data processing projects. He should train personnel in programming and prepare and maintain programmer's handbook of standardized routines and procedures.

8. Programmer

a. Qualifications. He should have a minimum of a high school diploma with two years of technical training in computer operations and in principles of programming, or equivalent job experience in these areas. He should have two or more years or progressively responsible experience in programming. He should have demonstrated above average capabilities in his prior employment as a programmer.

b. Responsibilities. Under general direction of the senior programmer, he should prepare block diagrams and detailed flow charts to represent work order of data to be processed in educational data processing projects. He should convert flow chart to program codes and devise sample input and tests program. He should correct program errors and review and rewrite programs as required. He should prepare operating instructions and program documentation.

9. Junior Programmer

a. Qualifications. He should be a high school graduate with two years of technical training in computer

operations and in principles of programming or equivalent work experience in these areas.

b. Responsibilities. Under the immediate direction of the senior programmer, he should assist in programming simple problems and segments of complex problems, relating to data to be processed in educational data processing. He should translate problem statements, block diagrams and flow charts into program codes, and assist in program testing, debugging and revision.

D. Operations

10. Operations Supervisor

a. Qualifications. This individual should have at least a high school diploma and four years experience in operating computers, peripheral and off-line equipment. Graduation from two years of technical training in electronic data processing will reduce experience requirements. He should have at least one years experience as manager or assistant manager of operations or a supervisory position in electronic data processing installation. He should have demonstrated a consistent capacity to meet the schedule in effect. He should also have had a minimum of six months experience in programming or its equivalent.

b. Responsibilities. He should coordinate the activities of machine operators and keypunch operators so that the requirements of all staff personnel are met. He should formulate objectives for the department. He should periodically appraise the personnel under him and make recommendations for compensation. He should schedule his department's operation so as to meet the requirements of those to whom center services are being provided. He should periodically check operating methods and recommend changes in routine and operating instructions. He should assign personnel and schedule workflow and direct the training of new operators.

11. Other Operational Personnel

a. Computer/Machine Operator

(1) Qualifications. This individual should be a high school graduate with two or three years experience in operating computers, peripheral and off-line equipment. Graduation from two years of technical training in electronic data processing would suffice. At least one years operating experience in data processing installation is considered important.

(2) Responsibilities. Under direction of the operations supervisor, the individual operates and monitors educational data processing and peripheral equipment; selects and loads input and output units; observes machines and computer console; corrects operational errors or failures; follows schedule of operations; records operating and down-time; and is generally responsible for all machine/computer operations appropriate to the functioning of the data center.

b. Keypunch Operators

(1) Qualifications. These individuals should be high school graduates with formal or on-the-job training and at least six months work experience.

(2) Responsibilities. They would perform all keypunch and key verification operations necessary to the proper operation of the data center.

c. Secretaries

(1) Qualifications. These individuals should be high school graduates. They should have

at least one years work experience in office situation and meeting the public.

(2) Responsibilities. They would provide necessary secretarial assistance to the staff.

d. Documentation Editor/Secretary

(1) Qualifications. This individual should be a high school graduate with at least two years work experience in data processing or a writing position. She must have a demonstrated proficiency in typing.

(2) Responsibilities. This individual would not only provide necessary secretarial assistance to the staff, but would prepare the documentation necessary for the presentation, organization and communication of recorded specialized knowledge.

e. Control Personnel

(1) Qualifications. These individuals should be high school graduates with at least two years work experience in data processing.

(2) Responsibilities. They would be responsible for checking input from the various schools and assuring the adequacy of controls. Also, they would review the output for completeness and accuracy before transmitted to the school systems.

f. Transportation Personnel

(1) Qualifications. These individuals should be high school graduates with demonstrated driving proficiencies.

(2) Responsibilities. They would transport data between the school systems and the data center.

g. Accountant

(1) Qualifications. This individual should have a commercial college degree or two years undergraduate work with emphasis on accounting or business courses. He should have minimum of four years work experience in accounting field.

(2) Responsibilities. He would be responsible for the maintenance of financial and operational records as necessary for creation of cost data on systems design and programming. He would be responsible for allocations associated with new or added membership in the cooperative operation.

E. Services/Conversion Personnel

12. Curriculum Specialist

a. Qualifications. This individual should have Master's or Doctor's degree in education with ten or more years work as a teacher, consultant, principal, or curriculum director. He should have an outstanding capability in working with all types of individuals and be skilled in understanding the problems to which data processing is to be applied in the school systems. He should possess above average verbal and written communication skills. He should be public relations oriented and have demonstrated the ability to supervise others.

b. Responsibilities. He would have overall responsibility for supervising and developing curriculum materials at each school system and would direct the activities of his staff members in that connection. He would coordinate local in-service meetings for teacher instruction in educational data processing. He would work with local curriculum directors in system-wide studies of applications for computer usage in all levels of study. He would be responsible within the framework of authority delegated

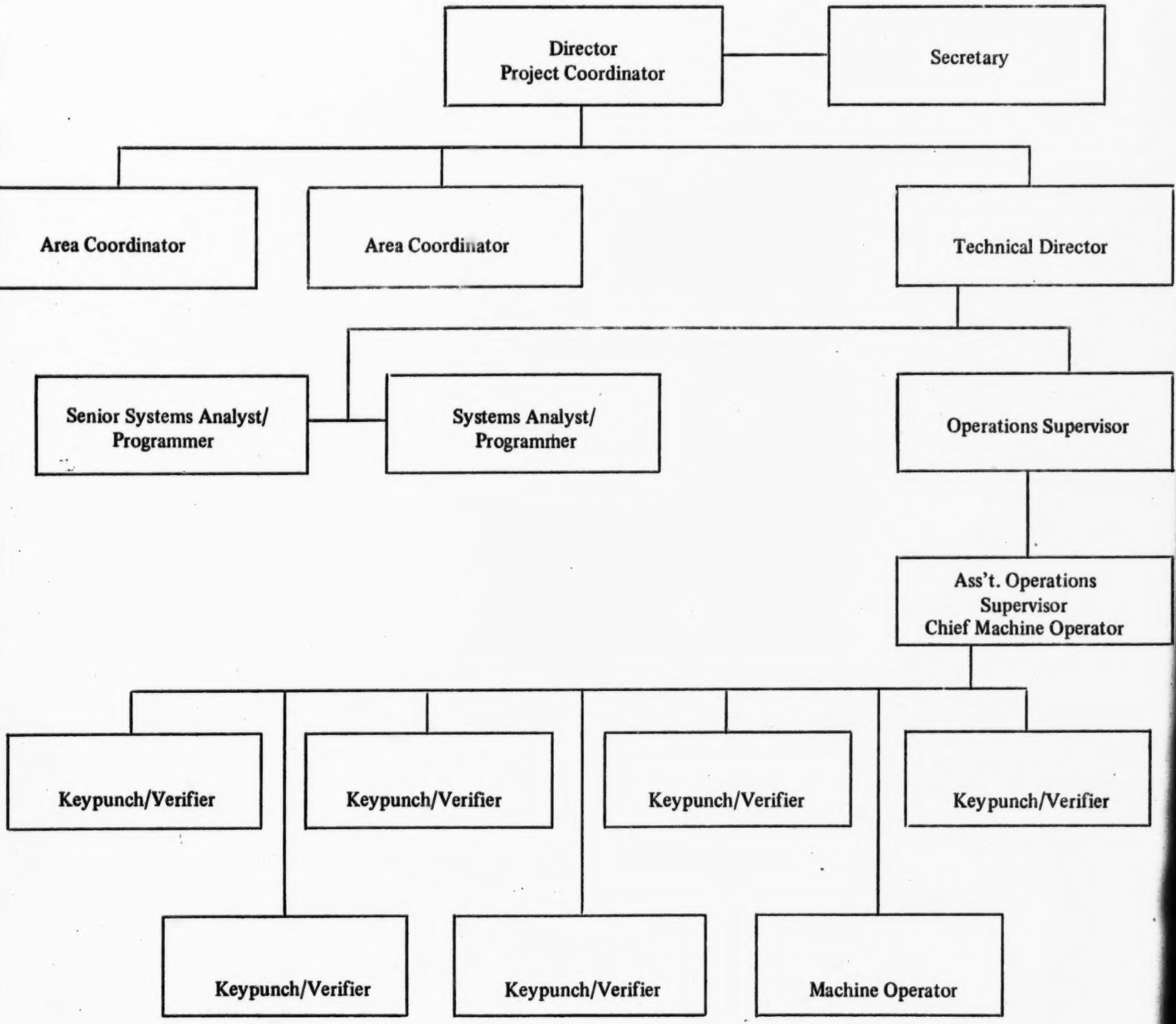
to him to call on school systems not participating in the center data processing program and work out arrangements suitable to the prospective school and the center.

13. Curriculum Consultant and Assistants

    a. Qualifications. These people should have a B. A. and at least one years experience in programming. They should have good verbal communication skills and be able to work easily with a wide variety of school personnel. They must be public relations oriented. They should have an above average interest in technical details and some knowledge and experience with communication terminals.

    b. Responsibilities. Since these people would probably be employed by local or county school systems, they would be strictly assigned to that area. These individuals will serve as the communicators of revisions that need to be made to existing applications in order to improve upon them or meet the requirements of an individual school system. They will work in their area with the curriculum specialist and others in instructing teachers in educational data processing. They will help develop and oversee appropriate conversion schedules.

BASIC
ACCESS--ALPINE
PERSONNEL
CHART



IMPLEMENTATION

In Part IV of our EVALUATION SUMMARY (March, 1967) of the Area IX Total Information System we concluded that:

> In attempting to provide the best possible information services for all schools in the area, Project personnel have, in many cases, tailored services for individual schools and school districts. In the opinion of this evaluator, that has been the most serious mistake made by the Project. If the Project is to develop and implement the remaining systems needed to fulfill the goals of the Project, the Project personnel cannot afford to continue to develop separate systems and procedures or write separate computer programs for individual schools or even for individual districts. A more efficient and logical approach, and an approach that must be used if all the systems necessary to the implementation of a total information system are ever to be provided, would be to work with representative groups of educators in the area on the planning and development of standard services that would be offered to all schools. This would not mean that the services would be completely inflexible or that individual needs of schools could not be met. Flexibility could, and should, be built into the standard services. However, the services should be developed in such a way that, for a particular service, all schools can be run with one set of computer programs.

We feel that the needs and problems of a local school district can better be met through this uniform yet flexible information system as opposed to a more thorough information system.

When implementing the Center project, some of the possible computer applications are as follows:

Accident records: analysis for
    safety programs
Accounting:
    Payroll
    Building and Sites

Administration:
- Analysis
- Attendance records: analysis, processing, summaries
- Budgeting
- Classes, scheduling
- Courses, scheduling
- Exams, scheduling
- Honor rolls, compilation
- Records, maintenance
- Report cards: preparation, issuance
- Revenue and expense accounting
- Rooms, scheduling
- Sections, scheduling
- Student loan applications: processing
- Student records: interpretation, processing
- Student registration
- Supply accounting
- Teacher scheduling
- Teacher credential issuance
- Test results, compilation

Alumni records:
- Analysis
- Mailings
- Maintenance

Aptitude tests: scoring, analysis

Audio-visual instruction

College board examination:
- Interpreting
- Scheduling
- Scoring

College selection: aiding high school students to select colleges

Computer-assisted instruction, area college:
- Chemistry
- Languages
- Mathematics
- Medicine
- Physics
- Statistics

Computer-assisted instruction, elementary:
- Arithmetic
- History
- Reading

Computer-assisted instruction, high school:
- Algebra
- Biology
- Languages
- Physics

Curriculum searches: instructional aids
Finance:
- Amortization
- Bond bidding
- Bond evaluation
- Cash flow analysis
- Equipment accounting
- Funds: accounting, analysis
- Losses: distribution, reserves
- Statements:
  - Annual
  - Monthly
  - Quarterly
  - Semi-Annual

Identifying "Underachieving" bright students
Laboratory experiments: automatic control
Language teaching
Matching teachers with job vacancies
Personality test analysis for counseling
Teacher standards evaluation
Teaching
Test grading
Training manuals: preparation, maintenance

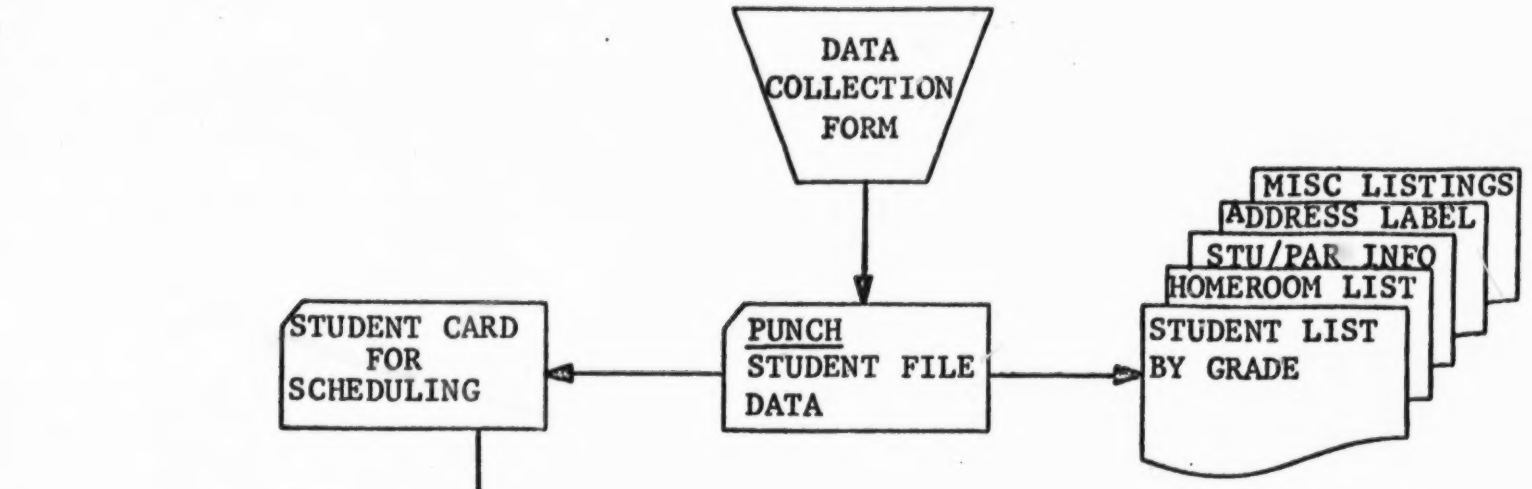
Services

The chief services offered by the ACCESS and ALPINE Centers are Scheduling, Mark and Attendance, Machine Test Scoring, and Payroll and School Census. In addition, many other activities aimed at increasing local use and acceptance of electronic data processing are carried on. These include an extension course in educational data processing, FORTRAN computer language classes, CAI Workshop, orientation visits with school faculty and board of education members, and class visits to the centers.

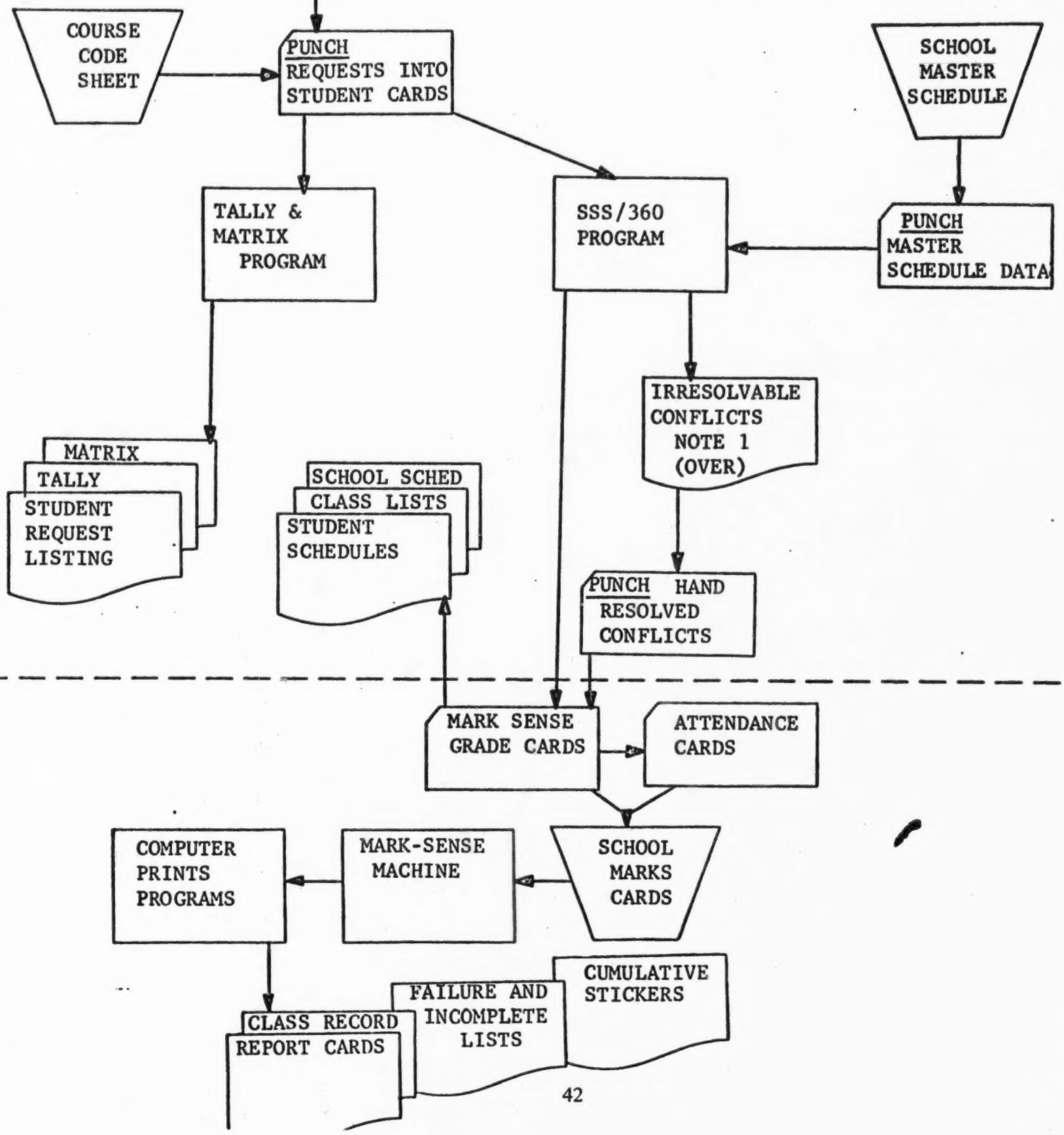
An ACCESS Center description of each of the five major services follows with a Scheduling, Mark and Attendance flowchart system.

ACCESS STUDENT SCHEDULING, MARK AND ATTENDANCE REPORTING SYSTEM

YELLOW SECTION



PINK SECTION


COURSE CODE SHEET
PUNCH REQUESTS INTO STUDENT CARDS
SCHOOL MASTER SCHEDULE
TALLY & MATRIX PROGRAM
SSS/360 PROGRAM
PUNCH MASTER SCHEDULE DATA
IRRESOLVABLE CONFLICTS NOTE 1 (OVER)
MATRIX TALLY STUDENT REQUEST LISTING
SCHOOL SCHED CLASS LISTS STUDENT SCHEDULES
PUNCH HAND RESOLVED CONFLICTS

GREEN SECTION

Scheduling

The following features are included in this computer program:

1. Course, period, and section possibilities
   a. Up to 99 periods per day
   b. Up to 40 course requests per student
   c. Up to 777 course offerings
   d. Up to 99 sections per course

2. Study halls are assigned for all available free periods.

3. Up to four quarters may be scheduled simultaneously in one run. Full-year scheduling may, therefore, be accomplished. However, most schools use two semesters.

4. Common-course scheduling (that is, scheduling a group of students who request one or more identical courses) may be accomplished. One common course card may carry up to ten courses thereby avoiding the need to report requests on individual student request cards.

5. Lunch periods are not a special feature of the system, but can be treated as a course and incorporated in a common-course card.

6. The school may substitute a table of alternate courses for regular courses in the master schedule. These alternates are generalized at the school level. In case of a conflict, the alternate can be utilized thereby lowering the number of rejects.

7. The SSS/360 attempts to maintain section balancing through the even distribution of students among all sections. A sex control can be used to balance the boy-girl mix in the classroom in proportion to the number of boy-girl requests for the course, or to guarantee an all-boy or all-girl class.

8. A student may be scheduled with one irresolvable conflict if the school desires. This is termed a partial schedule and the school specifies the course(s) it will permit to be left out of the student's schedule.

9. The user specifies the maximum number of scheduling iterations allowable for one student. This is usually 25,000.

The scheduling process provides the following output:

1. Pupil lists, alphabetized by grade level
2. Homeroom lists
3. Pupil/parent information printout
4. Pupil address labels
5. Miscellaneous listings such as an alphabetized listing of all pupils in a school
6. Pupil request listing
7. Conflict matrix
8. Tally of pupil requests
9. List of irresolvable conflicts
10. School master schedule
11. Pupil class list
12. Pupil schedules

Mark and Attendance Reporting

Teachers use mark-sense grade cards to record information necessary to produce pupil report forms. A mark-sense Tardy and Absence Card provides the necessary attendance data.

In addition to report forms, other output items include a class list and record, failure and incomplete list, and cumulative stickers.

Machine Test Scoring

The ACCESS Center uses a 1230 IBM Test-Scoring Machine to score standardized tests made by various companies using 1230 answer sheets. In addition, the Center scores teacher-made objective tests designed for multiple-choice, true-false or matching questions. The machine will score answer sheets at the rate of 1200 per hour and is equipped to give part scores as well as total scores.

The scoring options are as follows:

1. Number of right responses
2. Number of right responses minus number wrong
3. Number of right responses minus 1/2 number wrong
4. Number of right responses minus 1/4 number wrong

Teacher-made tests require use of a 509 answer sheet, which has space for 150 true-false questions or five-part multiple-choice type.

Optional information is possible by automatically punching cards as the test is being scored and then processing those cards through the computer. There are three options available for additional information: (1) item analysis, (2) percentile rank, and (3) item analysis and percentile rank.

Payroll Accounting System

The Payroll Accounting System Services include payroll deduction calculation, warrant printing, preparation of two payroll registers (current pay period and year-to-date), quarterly report printing, and W-2 form printing.

School Census

The ACCESS Center has developed an 8 1/2-by-11 optical scan data-collection sheet for use in conducting school district census activities. The completed sheet is processed and the information then fed back to the school district.

The ACCESS Center employs teachers and other professional staff members to take the census. This procedure enables trained personnel to accomplish purposes other than just securing factual information on children. Through skillful interrogation in the process of taking the census, trained personnel may be able to uncover general lay reactions toward the school which if dealt with early might make children's lives happier.

There is a great deal of misunderstanding in the school community regarding the management and program of the school, particularly among parents whose children are too young to attend school. Some of these parents have fears that are unfounded or notions that are highly unrealistic. Census enumerators who are trained school personnel can do a great deal to allay parental fears and to establish a relationship with parents that can have real educational significance. Many parents of physically or mentally handicapped children are often reluctant to give definite information regarding these children -- information that would enable the school to better serve their needs. Skilled census personnel made up of professional educators who understand the problems of the handicapped and the resulting psychological effects on the parents are in the best position to obtain the information desired.

In general, the role of the census enumerator is being expanded to include giving out as well as collecting information.

HARDWARE/SOFTWARE

Although it is not necessary for a center to start out with a large, fast system it is imperative that the initial system installed have the capabilities to accomplish the stated objectives and have some growth potential.

A center should have personnel knowledgeable enough in equipment types and capabilities that they can control manufacturer's proposals and be a reasonable judge of equipment feasibility. It is advisable to enlist as advisors, representatives from local private business who have experience in computer hardware acquisition, installation and operation. In addition to the experience that they have to offer, these people have a vested interest in regional centers and the benefits resulting from them in the future.

Generally speaking "work" must be worthwhile for incorporating into any system. In other words, it must have a need to be handled by a computer of any type. The extent of the need and the complexity of the problem would have a hand in determining the type and size of equipment necessary. For example, a greater portion of the "work" must require a large scale computer to justify one. No computer should be consulted for requirements that do not exist at the time. Usage should be restricted to payable applications.

What is a payable application? It is an application that is payable in dollars or otherwise. It must contribute substantially to the operations, competitiveness or well being of education. One or any combination of the following are factors contributing to a payable application:

1. Savings in personnel
2. Faster work (if necessary)
3. Greater volumes handled (not before possible)
4. Accuracy (not before able to maintain)
5. Association (interrelation of problems for analysis - not before possible)

6. New information (not before attainable)

Somewhere along the line it should also be determined how much time, effort and expense a payable application is worth. Once an application is deemed worthwhile it must be thoroughly defined. "No decision" information need not be presented for consideration. Sufficient time should be allocated for planning.

Only after planning has been organized and begun should a computer be ordered. The applications should dictate the equipment selection. Planning and development should proceed in parallel. That is, ideally the initial equipment installed would be phased out in three years with more powerful equipment being phased in on an overlap basis. This means that there should be some software and/or hardware compatibility. Proceeding properly will not necessarily limit you to one manufacturer.

In order to accomplish their objectives, Iowa's regional centers installed low range medium scale general purpose IBM equipment to begin with.

A typical beginning computer installation offering a wide variety of input, output, file and processing choices was:

1401	Central Processing unit equipped with 16,000 positions of core storage and the advanced programming package.
1402	Card read-punch. Reads at 800 CPM and punches at 250 CPM.
1403	Printer. Prints at 600 LPM.
1407	Console inquiry station. Can do without this feature of direct inquiry.
7330 (2)	Magnetic tape units for high volume, low cost storage and processing.
1311 (2)	Disk Drives (2). Over two million characters of information per disk pack. Offering some random access capabilities.

1231 Optical Mark Page Reader. For mark sensing original documents from the schools directly into the computer.

Most other computer manufacturers can provide a comparable configuration of equipment at a comparable price.

Because the 1401 is now discontinued as a new machine, has limited growth potential and is not efficiently upwards compatible with IBM's newer 360 line, it is suggested that this not be seriously considered as beginning equipment. IBM and most other manufacturers have equipment more suitable for your consideration.

To round out the data processing center, supporting peripheral equipment such as keypunches, sorter, collator, interpreter and reproducer is necessary.

Later, in addition to an expanded installation growing through applications and number of users it would be worthwhile to consider augmenting the system with remote terminals. Besides adding the capabilities of direct computer access from remote locations, terminals offer interesting possibilities for teaching, practicing and computer assisted instruction.

Software, that is, the programs, processors, routines, and procedures allowing a computer system to perform job functions, merits much consideration. All hardware suppliers offer one or more languages for use with their equipment. Manuals and training are available to customers and prospects for their consideration or preparation for operations. In addition to these languages certain other common languages, such as FORTRAN, COBOL and ALGOL, that will operate on any equipment with minor modifications is available. These languages, however, are not usually as efficient as the manufacturers own language tailored for his machine.

Most manufacturers offer packages for performing specific functions in specific areas, such as education, hospitals or business, that merit consideration and scrutiny. Good packages can save much work and expense while allowing you to become operational sooner in specific areas. Other common packages such as sorts, merges, prints, etc. are also available. Some equipment may be functional with its manufacturer's executive or operating

system which may contain several of the basic machine duties. The completeness of an operating system is usually governed by machine size and capabilities.

All suppliers will provide a certain amount of systems help for developing your own software. This is important because the crux of your operations is going to be what you develop for yourself in the way of software. Many problems can be avoided by having good people on your staff, because most software will be staff designed.

Another source for usable software may be another operational data center with compatible equipment that has developed their own software for specific purposes. Most centers are very cooperative in sharing ideas and experiences.

Iowa's data centers designed most of their own software. Some supplier help and packages were used and some ideas were borrowed from other centers. They have found, however, that a center can develop with a sounder base when systems are generated from within as the need arises.

DISSEMINATION OF PROJECT INFORMATION

Iowa's regional centers, particularly the Area XI ACCESS Center, have exerted great efforts to disseminate as much information as possible regarding their services to school boards, administrators, and the public. This tends to remove any shroud of mystery or complexity from their data processing efforts.

Information has been disseminated through publications, convention displays and participation, workshops and briefings, meetings, visitations, technical exchanges, and fulfilling requests for information.

Publications such as county information sheets, progress sheets, workshop materials, graduate course announcements, complete application manuals, newsletters, news bulletins, convention programs and displays, book and film services booklets, newspaper articles, TV specials and even center birthday announcements have been employed. Publications have aptly covered purpose, accomplishments, participation, status, news and complete procedures and demonstration.

Workshops or briefings have been held on new procedures and for reviewing standard procedures regarding the various programs available. Area XI particularly participated very heavily in the annual Iowa Association of Educational Data Systems Convention. Principals' meetings, faculty meetings and open houses also served to enhance the center's area positions. Area Center staff were called upon and made themselves available as guest speakers to state, county and local educational groups. They also attended meetings for staff background and new ideas.

Several individuals and delegations from both in and out of state were hosted at the area centers. These included public instruction, university and private enterprise people as well as students.

Technical exchanges were held with other school systems both in and out of state resulting in the addition of considerable potential for future services.

Persons coming from 16 different states have written unsolicited requests for information about the Area XI ACCESS Center. These have been answered with dissemination pieces, progress reports or a letter.

Generally it is felt here in Iowa that a program of dissemination, technical exchange and publicity is all important as a contributor to success in the comparatively new concept of regional data centers. Do not overlook this concept in your early planning stages.

EVALUATION

To be ultimately successful, every undertaking should have some method of evaluating their status. Evaluations may be performed in any of four categories: (1) general, (2) structural, (3) operational, and (4) financial. The general, structural and financial evaluation should be management oriented. The operational evaluation should be more systems oriented and aimed towards all interested parties regardless of background.

Evaluations should be made either periodically, when a major checkpoint is reached, or for a specific purpose.

In addition to ascertaining status, practicality, funding and direction, evaluations are valuable as a reporting instrument. They generally satisfy certain purposes of reporting, such as:

1. Demonstrate an understanding of the project
2. Develop new views of a project
3. Establish benchmarks
4. Bases for study
5. Complete description to date in one place
6. Dictionary of terminology and language
7. Communicate proper description

Evaluations should perform some kind of a measurement of conditions. Any of three factors may be used in arriving at a measurement:

1. Direct - that is, counts, time saved, time elapsed, dollars, duration, etc.
2. Indirect or derived - a percentage or ratio designating return on investment or efforts.

3. Subjective - moral improvement, service improvement, etc.

To satisfy project objectives, some kind of an improvement must be shown by the services performed. Within the above factors, the following categories may be used to measure performance:

1. Cost
2. Time
3. Accuracy
4. Reliability (stability, durability, availability)
5. Security
6. Quality (tolerance)
7. Flexibility
8. Capacity (average, low, peak, load)
9. Efficiency
10. Volumes (dimensions)
11. Attitude (customer, employee, manager, public)
12. Service (satisfaction)

Some final thoughts on evaluation are:

1. How is it going to be done and who sets the criteria for how it's going to be done?
2. Who is going to do it and who sets the criteria for who should do it?

These are questions that a center's management, staff and advisory committees should get together on for decisions and policy.

BUDGET

While equipment, quarters and basic staffing costs can be readily ascertained, developmental costs can be influenced by a number of factors not known at the onset when developing a center. The lack of precedent in certain undertakings can also contribute to the difficulty in projecting an accurate budget. Thus, initial cost estimates are difficult to make and often are misleading or meaningless.

However, we feel that experience gained by staff members of Iowa's Regional Processing Centers will provide a basis for more realistic initial cost estimation.

It should be noted that there will be three major areas of cost, namely: (1) people, (2) equipment, and (3) supplies and overhead. In addition, there will be certain one-time coordination, developmental and equipment costs. Developmental costs can be expected to be higher than those incurred in routine operations following the developmental period. Post developmental costs would be influenced by the scope of operations, future growth, office equipment and space provisions, going rates for salaries, and the like.

The following might be typical of what costs can be expected during the beginning year of establishing and initiating a center. In Iowa's case, a higher percentage of the funds were obtained from HEW Title III grants the first year than in succeeding years.

BUDGET EXHIBIT I
ESTIMATED PROGRAM BUDGET
FIRST YEAR

EXPENDITURE ACCOUNTS		ESTIMATED EXPENDITURES
	Title	Total Amount
1.	Administration	$124,950
2.	Instruction	
3.	Attendance	
4.	Health Services	
5.	Pupil Transportation Services	
6.	Operation of Plant	2,160
7.	Maintenance of Plant	
8.	Fixed Charges	14,496
9.	Food Services	
10.	Student-Body Activities	
11.	Community Services	
12.	Capital Outlay Equipment only (Exhibit III)	11,581
13.	Other Contracted Services	25,000
	Supplies, Travel, Rental of Equipment	82,390
14.	Totals	$260,577 *

* Sources of funds - local, state, federal.

BUDGET EXHIBIT II
ESTIMATED PROGRAM BUDGET
SECOND AND THIRD YEAR

Expenditure Accounts		Est. Expend. For 2nd Year	Est. Expend. For 3rd Year
	Title	Total Amount	Total Amount
1.	Administration	$162,125	$185,180
2.	Instruction		
3.	Attendance		
4.	Health Services		
5.	Pupil Transportation Services		
6.	Operation of Plant	3,600	3,600
7.	Maintenance of Plant		
8.	Fixed Charges	14,366	15,654
9.	Food Services		
10.	Student-Body Activities		
11.	Community Services		
12.	Capital Outlay Equipment only (Exhibit IV)	13,229	838
13.	Other Contracted Services	25,000	25,000
	Supplies, Travel, Rental of Equipment	103,590	147,990
14.	Totals	$321,910 *	$378,262 *

* Sources of funds - local, state, federal

EXHIBIT III
ESTIMATED BUDGET FOR EQUIPMENT TO BE PURCHASED
FIRST YEAR

Quantity	Name of Item	Unit Cost	Total Cost
8	Single Pedestal Desks	$ 165.00	$ 1,320.00
2	Double Pedestal Desks	208.00	416.00
9	Desk Chairs	77.00	693.00
1	Steno Chair	33.00	33.00
14	Side Chairs	26.00	364.00
10	Four Drawer Files	112.00	1,120.00
10	Bookshelves	33.00	330.00
2	Electric typewriters - 17"	385.00	770.00
10	Wastebaskets	6.00	60.00
1	Desk typewriter stand	77.00	77.00
1	Typewriter stand w/casters	37.00	37.00
2	Keypunch desks	111.00	222.00
2	Posture Chairs - Keypunch	43.00	86.00
5	Disk Packs	490.00	2,450.00
2	Card wastebaskets Jumbo	21.00	42.00
2	Utility card racks	143.00	286.00
3	20 drawer files	252.00	756.00
1	Panel end table	134.00	134.00
1	Printing desk calculator	600.00	600.00

Quantity	Name of Item	Unit Cost	Total Cost
2	Coat racks	$ 42.50	$ 85.00
1	Electric adding machine	300.00	300.00
1	Burster	1,400.00	1,400.00
		TOTAL	$11,581.00 *

* The total cost of equipment in Exhibit III should agree with the amount shown in Exhibit I, item 12.

EXHIBIT IV
ESTIMATED BUDGET FOR EQUIPMENT TO BE PURCHASED
SECOND AND THIRD YEARS

Quantity	Name of Item	1968 Unit Cost	1968 Total Cost	1969 Unit Cost	1969 Total Cost
2	Desk S/P	$165.00	$ 330.00		
1	Desk D/P	208.00	208.00		
2	Desk chairs	77.00	154.00		
1	Steno chair	33.00	33.00		
3	Wastebaskets	6.00	18.00		
3	4 drawer files	112.00	336.00		
3	Bookshelves	33.00	99.00		
3	Side chairs	26.00	78.00		
2	Panel end tables	120.00	240.00		
1	Tape storage cabinet	108.00	108.00		
2	Disc storage cabinets	178.00	356.00		
2	Card & form storage cab.	108.00	216.00		
1	Decollator	325.00	325.00		
1	Sorting rack & stand	48.00	48.00		
4	Floor mats	14.00	56.00		
5	Disc pack units	490.00	2,450.00		
12	Magnetic tapes	45.00	540.00		
1	Cart	138.00	138.00		
1	Keypunch desk	174.00	174.00		
1	Posture chair	43.00	43.00		
1	Card wastebasket	21.00	21.00		

Quantity	Name of Item	1968 Unit Cost	1968 Total Cost	1969 Unit Cost	1969 Total Cost
1	Utility card rack	$ 50.00	$ 50.00		
2	Large wastebaskets	21.00	42.00		
4	20 drawer files	252.00	1,008.00		
4	Program files	112.00	448.00		
4	10 drawer files	136.00	544.00		
1	Duplicator	800.00	800.00		
8	Folding tables	42.50	340.00		
8	Tables	105.00	840.00		
70	Stacking chairs	29.00	2,030.00		
2	Blackboards	32.75	65.50		
4	Bulletin boards	39.50	158.00		
1	Overhead projector	186.00	186.00		
1	Projection screen	70.00	70.00		
2	Portable lecterns	185.00	370.00		
3	Coat racks	42.50	127.50		
3	Bookshelves	33.00	99.00		
1	Magazine rack	80.00	80.00		
2	Desks S/P			$165.00	$330.00
2	Desk chairs			77.00	154.00
2	Side chairs			26.00	52.00
2	4 drawer files			112.00	224.00
2	Bookshelves			33.00	66.00
2	Wastebaskets			6.00	12.00
		TOTAL	$13,229.00 *	TOTAL	$838.00 *

* The total cost of equipment in Exhibit IV should agree with the amount shown in Exhibit II, item 12.

PROBLEMS ENCOUNTERED

No project is without its problems. The following problems, encountered during their development period, were significant to our Regional Centers when related to pace but insignificant in reaching their objectives. They are being or have been overcome and none constitute a barrier to center development. They are merely being pointed out as problem areas to watch for and prepare for. Often times just knowing where problems may occur can be of significant value in planning, development and timing.

1. Probably the most significant problem any center will encounter will be that of educating users or prospective users as to the services available and/or under development. An in-service program is desirable for administrators so that they may utilize the center for specific uses and general applications. The user should be aware of and involved in programs and program development.

   Communication of detailed instructions for participation in a program deserves a great deal of thought and planning.

2. In the creation of forms and program design the acceptance of uniformity by the user presents quite a challenging problem.

3. The hesitancy of small districts to involve themselves in regional programs is another problem area. It's quite true that their need for services such as scheduling is slight, but the benefits of standardization, uniformity and being involved in data processing (which is here to stay) must be pointed out. Continuity in several areas of application can make it much easier for a district to train new clerks or withstand an audit. A good selling plan can solve this problem.

4. The technical area can be one of great problems if not properly planned. Growth must be kept under harness. Start slow and grow slow. Unplanned ambitions or commitments could result in an inability to deliver or in pure bedlam.

5. Staffing must be well planned. A good balance of specialists is needed. Because of the nature of a center's programs it would be easy to become too technically oriented. The staff should have an equal balance of educational, systems and operations people with the educators determining what is to be done, the systems people determining how it is to be done, and the operations people doing it.

Many other problems of less significance can be expected to be encountered. Some will be unique to a particular center and others can be avoided by background documentation such as this manual presents.

SUMMARY

A very effective summary for Data Center operational guidelines has been presented in the following letter to Mrs. Ellen Gee of Greensboro, North Carolina from Dr. Marvin Ingle of Iowa's Area IX ACCESS Center.

May 27, 1968

Mrs. Ellen Gee
Director, Computer Services
Greensboro Public Schools
Greensboro, North Carolina 27402

Dear Mrs. Gee:

Your inquiry of May 15 addressed to our Mr. K. W. Miller has been directed to me for reply.

As you undoubtedly know, there is no better way of flattering a person than to ask advise of him -- or to say things about him that are a bit exaggerated. So if my reply seems too long just take into account the vain streak in all of us has risen to the surface -- and cast aside whatever recommendations seem unreasonable to you and keep the ones which look good to you.

(1) Secure a committal in writing from the schools you hope to serve -- supporting the proposed goals both in spirit and with dollars -- and the amount is not awfully important.

(2) Involve your clients in the planning stages of the project -- and do not expect them to be enthusiastic about supporting something they don't understand or is being dumped in their lap.

(3) Plan a PERT type of flow of work and deadlines for the accomplishment of certain tasks --

with built-in checks, to see if it's happening as planned and why not.

(4) Do not overlook the need for time -- time -- time to do systems work before actual operations begin. Hire someone with proven ability and familiar with school operations to be responsible for the system developed. You might be interested in a consultant for this task if you can't afford a permanent full-time employee.

(5) Start slowly -- and do well the few applications you decide are most important to the success of your project. Tis better to do a few things efficiently than to try to "cover the waterfront" and become a madhouse.

(6) Give your clients opportunities to know about data processing in general, an informed customer is your best means of gaining support and constructive criticism.

(7) Carry the decision makers in the County offices and the 21 local districts along by furnishing first those services which directly influence their own work or the work of those close to them. For example, scheduling is a tremendous job for the principal, if the time he devotes to scheduling is reduced markedly, he will have time to devote to other duties.

(8) Keep everyone informed what you are doing and what you plan to do.

(9) Don't be afraid of failing -- people who never try never fail -- but they are stationary and don't make progress. It is just as important sometimes to know that a certain application won't work as it is to discover it does work.

(10) If your efforts could be supported on a county-wide (or even more preferable, on an area-wide

basis) but there is a reluctance to relinquish sovereignty to an area computer center, make sure your services to local school personnel are prompt, efficient, and courteously rendered. Then the local school superintendent will be in a position to put pressure to gain support on a larger-area basis.

(11) Secure the services of a professional educator who has become informed in the data processing field to serve as full-time liaison between your shop and the local district. Our two area coordinators are tremendous public relations men, know school problems and speak "the language of school people" -- and are able to communicate with technical personnel to the extent they can make their wishes known.

(12) Pay your people as much as you can afford to avoid attrition in your staff. The outlay for salaries should about equal your expenditures for machine rental and other costs.

(13) Define responsibilities and organization channels in great detail so friction will not be generated through inadvertant infringement on another's "unstaked" rights.

(14) The educators should decide on <u>what</u> is to be done -- the technical personnel should be responsible for determining <u>how</u> it is to be done in shop; the educator, how it will be done in the field.

(15) The physical appearance of your shop -- and the privacy and quiet available to professional educators and systems and programming staff -- will increase working efficiency and the prestige of the center.

(16) Cut turn-around times to the bone -- nothing is so convincing as fast and accurate service.

(17) Bring in outside experts (from business and tax studying bodies) to evaluate the feasibility of your proposal. Likewise, plan the system to be used for evaluating your project periodically and make the criteria known to the entire staff and also the people you serve. Employ a disinterested and impartial expert to evaluate your accomplishment for the first period -- and make the results known.

(18) Seek advise from experts -- as well as representatives from your patrons before any new or innovative applications are to be put into operation.

(19) On any new application, pilot test it thoroughly before offering it on an area-wide basis.

(20) Insist on the software support your hardware vendor is obligated to give you.

(21) Make the man in charge the same person who controls the purse strings.

(22) Don't expect miracles in your efforts to employ the computer in the instructional programs. CAI is awfully expensive and requires astronomical amount of time, professional educator talent, and volumes of technical systems and programming work. It is almost prohibitive without the financial support of a foundation or the government.

(23) Keep accurate records of the activities of all your personnel -- file these -- and use them in evaluation of their work.

(24) Likewise, keep accurate records of machine usage to assure realistic cost figures for each type of operation.

(25) Don't try to tailor-make your service to suit the whims of each client -- use committees to gain a concensus of the "best" for the area -- then

supply forms, change content, furnish print-outs, etc., only in accordance with that decision.

(26) Whenever the volume warrants, promote from within if possible -- but not to the detriment of the whole project.

(27) Cooperate and meet regularly with neighboring area centers to exchange ideas and to accomplish compatibility of hardware and software if possible. This could eliminate a great deal of implication in systems and programming effort.

(28) Afford opportunities for each member of your staff to learn as much as he can about the duties of every other member. The more each person knows about the obligations and methods of other staff members, the more he will come to appreciate his position in the organization and his contributions to its reaching the agreed-upon goals.

(29) Remember, your project can only be as good as the people you employ.

(30) Provide ample clerical support so that professionals are not stuffing envelopes, writing out letters, etc.

Thank you for this opportunity to give our philosophy -- but please don't be misled into thinking we have been successful in reaching all these goals. Far from it -- but we are trying -- and who can do more.

We'll be happy to hear from you and your success from time to time. If you have further questions about ACCESS, don't hesitate to air them.

Sincerely yours,

Marvin W. Ingle, Ed.D.
ACCESS Project Coordinator

P. S. The statements above are not listed in order of importance, but only as they came to my mind. I'm enclosing our first birthday card and our pirate sheet -- ideas for keeping our people informed.

EDUCATIONAL DATA PROCESSING LAYMEN'S BASIC GLOSSARY

ACCESS TIME - The time required to move a piece of information from its place in memory to the control section of a computer, or vice versa.

ADDRESS - A symbol, either numeric or alphabetic, that designates a particular place in a computer memory.

ALPHABETIC CHARACTERS - Characters which are letters of the alphabet.

ALPHANUMERIC CHARACTERS - Characters which are either letters of the alphabet or numbers.

ASSEMBLE - The translation of a program coded in a symbolic language into absolute machine language. Distinguished from compile by the fact that the asembly produces one machine language instruction for one symbolic instruction (one for one) whereas a compile produces many machine language instruction for one pseudo instruction (many for one).

ASSEMBLY PROGRAM - A translation program which constructs machine language instructions from symbolic instructions, at the same time performing many of the detail functions of programming.

BATCH PROCESSING - A system of processing in which a number of similar input items are pregrouped for processing during the same machine run.

BINARY CODED DECIMAL (BCD) - A coding system in which numbers, letters, and special characters are represented by an off-on state of bits in the form (1) (2) (4) (8) (A) (B).

BINARY CODED NUMERIC - A coding system in which numbers are represented by an off-on state of bits in the form (1) (2) (4) (8).

BINARY NUMBERING SYSTEM - A number system based on two symbols; 0 and 1.

BIT - Contraction for binary digit. General name for either of the symbols in the binary system -- 0 or 1.

CALCULATION - The performance of the operations of addition, subtraction, multiplication, and division to solve arithmetic problems.

CARD CODE - A combination of punches that is used to represent numbers, letters, or special characters.

CARD COLUMN - One of the vertical divisions of a unit record card in which can be punched the code to represent a number, letter, or special character.

CENTRAL PROCESSING UNIT (CPU) - That part of a computer system that contains the memory, the arithmetic - logic circuits, and the control circuits of the total system.

CHANNEL - One of the parallel tracks that is utilized in the coding of paper or magnetic tape.

CHARACTER - A number, letter, or special character.

CHARACTER RECOGNITION - The identification of characters by machine.

COBOL - The name of a business oriented compiler programming language: COmmon Business Oriented language.

CODE - Either a set of rules used to convert data from one form to another or to write instructions for a computer in either machine or some other language.

COLLATE - To merge items from two or more similarly sequenced files into one sequenced file. The rearrangement of files.

COMPARE - To relate two quantities or items to determine if they are the same (equal) or if they are different. To determine in what way two quantities may differ (larger or smaller).

COMPILE - The translation of a program coded in a problem oriented language into machine language. Distinguished from assembie by the fact that compiling produces many machine language instruction for one pseudo instruction (many for one) whereas an assemble produces one machine language instruction for one symbolic instruction (one for one).

CONSOLE - The component of the computer system that provides facilities for both manual control as well as observation of the system. Usually located at the CPU.

CONTINUOUS FOR PAPER - Forms of paper that are made together for continuous feeding into such machines as the ACCOUNTING MACHINE or PRINTER.

CONTROL UNIT - That part of the computer system which directs the sequence and performance of automatic operations, interprets coded instructions, and initiates the proper signals to the computer circuits to execute these instructions.

CONTROL PANEL - A board that can be wired and then inserted into select unit record machines to both control and increase its capabilities.

CORE - A small piece of metal capable of holding an electric charge.

CORE STORAGE - A form of high speed memory in which data is represented by means of coded charges on numerous cores.

DEBUGGING - The process of locating errors in programs and their correction.

DIGITAL COMPUTER - A computer in which numbers are represented in discrete form rather than continuous.

DOCUMENT - Any representation of information which can be read by a person: usually on paper.

EDIT - The rearrangement of information for machine input or output.

EXECUTE - To carry out an instruction or perform an operation.

EXECUTION TIME - The amount of time necessary to carry out an instruction or perform an operation.

FIELD - A group of one or more characters that have meaning as a unit.

FILE - A set of related records of data organized for use in a system.

FIXED WORD LENGTH COMPUTER - A computer in which each addressable word contains the same number of characters. Contrasted with a variable word length computer.

FLOWCHART - A graphic representation of the sequencing of operations that are required to carry out a data processing procedure. There are basically three types of such flowcharts:

STRUCTURE FLOWCHART - A flowchart that depicts the overall approach to the solution of a particular problem.

TECHNIQUE FLOWCHART - A flowchart that depicts the detailed operations that are necessary in accomplishing the solution of a particular problem.

SYSTEM FLOWCHART - A flowchart that depicts the overall flow of data and the operations performed at each step in the solution of a particular problem utilizing unit record data processing equipment.

FORTRAN - The name of a mathematically oriented compiler programming language: FORmula TRANslation.

HARDWARE - The mechanical, magnetic, electrical, and electronic devices that make up a data processing system.

HEXADECIMAL NUMBERING SYSTEM - A number system based on sixteen symbols: 0 through 9, A, B, C, D, E, and F.

HOLLERITH CODE - A coding system that makes use of columns and positions within each column to represent characters by means of punched holes.

HOUSEKEEPING - A procedure which precedes the running of a program that directs the machine to perform operations that set it up initially before actually performing the desired processing.

INFORMATION RETRIEVAL - The methods and systems for writing and recovering information from large storage facilities.

INPUT - Information transferred from any input device or any input/output-memory device to the internal memory part of a data processing system.

INSTRUCTION - A set of characters acting as a unit which cause the computer to perform one of its operations.

INTERPRETING - The printing of information on the document that contains it in punched form.

KEYPUNCH - A unit record machine that is used to prepare the punched card.

LIBRARY - A group of fully tested programs and subroutines that are used repeatedly.

LOGIC - The ability of the computer system to perform operations, compare data, and test system conditions.

MACHINE LANGUAGE - A language for writing instructions for a computer system in a form which can be directly executed by the system. Also referred to as actual or absolute language.

MACRO INSTRUCTION - A symbolically coded instruction resulting in a group of machine language instructions which will perform the desired operation when the program is compiled.

MAGNETIC CORE - A small piece of metal capable of holding an electric charge.

MAGNETIC DISC - A random access storage device upon which information is recorded on the magnetized surface of a revolving disk and can be read into or written upon by a computer system.

MAGNETIC TAPE - A flat ribbon of plastic that is coated on one side with a substance that can be magnetized and can be read in or written upon by a computer system.

MARK SENSING - A technique employing a special pencil whose marks can be detected and interpreted by machine.

MASTER FILE - A file containing records of accumulated and semipermanent information.

MEMORY - That part of the computer system that can retain information.

MERGING - The process of combining two sequenced files into one file retaining the same basic sequencing procedure.

MICROSECOND - One millionth of a second: .000001 sec.

MILLISECOND - One thousandth of a second: .001 sec.

MNEMONIC - A code that simplifies the remembering of information.

NANOSECOND - One billionth of a second: .000000001 sec.

NUMERIC - Having a value made up of digits (0 through 9).

OBJECT PROGRAM - A program in machine language which results from the translation of a non-machine language source program by an assembler or compiler.

OFF-LINE - Operation of equipment or devices that are not directly under control of the central processing unit of a computer system.

ON-LINE - Operation of equipment or devices that are directly under control of the central processing unit of a computer system.

OPERATING SYSTEM - A stored machine language program that can control the operating procedures of large or complex data processing computer systems.

OPERATION CODE (OP CODE) - The part of the computer instruction that designates the operation to be performed when this instruction is executed.

OPTICAL SCANNER - An input device that can sense printed characters and transfer them into a computer memory.

OUTPUT - Information transferred from the internal memory of part of a data processing system to any output device or any input/output-memory device.

PERIPHERAL EQUIPMENT - Any of several devices, primarily used to communicate with a computer system, that are not considered part of the central processing unit.

PROGRAM - All the necessary steps and instructions that are needed to direct the computer system to solve a problem or accomplish a processing application.

PROGRAMMER - An individual who prepares the necessary steps and instructions that are needed to direct a computer system to solve a problem or accomplish a processing application.

PUNCHED CARD - A card of standard size into which holes can be punched to represent information and which can be processed by machines.

RANDOM ACCESS STORAGE (MEMORY) - A type of memory which permits the computer to obtain information without seeking it sequentially.

READING - The conversion of information from an input device into machine interpretable impulses.

REAL TIME - A data processing set up in which the computer is able to receive and supply information while an operation is continuing.

RECORD - A group of related fields of information that is treated as a unit.

REPRODUCING - The copying of information from one source into another.

RUN - The execution of a machine language program.

SEQUENCE CHECKING - The checking of all items (or cards) in a file to assure that they are in the desired sequence arrangement.

SEQUENCE - The arranging of items (or cards) into a desired order arrangement.

SOFTWARE - The programs, processors, routines, and procedures which augment a computer system and allow it to be operative.

SORT - The rearrangement of items (or cards) that make up a file.

SOURCE DOCUMENT - Any document that contains the original information that is eventually used in a data processing system.

SOURCE PROGRAM - A program in a non-machine language that is translated by an assembler or compiler into a comparable machine language program.

STORAGE LOCATION - The address of any specific area in memory.

SPECIAL CHARACTER - Any character that is not either a number or a letter of the alphabet.

STORAGE - That part of the computer system that can retain information.

STORED PROGRAM - A series of machine language instruction that are stored within the memory of a computer and then executed to control the entire computer system.

STORED PROGRAM COMPUTER - A computer that can internally store and then execute its instructions.

SUBROUTINE - A short program designed to solve a specified portion of a problem.

SYMBOLIC ADDRESS - An alphanumeric name is used instead of an actual machine address.

SYMBOLIC PROGRAM - A program written in a language that is based on machine language but allows the usage of mnemonics, symbolics, and special routines to aid in programming. This program is converted by an assembler program into appropriate machine language.

SYSTEM ANALYSIS - The study of an activity to determine what is and could be done and best ways to accomplish the desired aims.

SYSTEM DESIGN - The drawing up of specifications of how a particular application could be accomplished through the use of data processing equipment and techniques.

UNIT RECORD - The preparation of a punched card which contains all the information pertinent to a transaction.

UPDATE - To change a master file to reflect additional ongoing information.

UTILITY PROGRAM - Standard programs used for common applications that are available to the computer system.

VARIABLE WORD LENGTH COMPUTER - A computer in which each addressable word contains different numbers of characters.

VERIFIER - A unit record machine that is used to check the accuracy of keypunching.

VERIFY - The checking of the accuracy of an operation.

WORD - A set of characters which are addressed by one memory address and are treated as a unit.

WRITING - The conversion of machine interpretable impulses into an output form on an output device.

ZONE PUNCHES - One of the three top punching positions on a card using the Hollerith code: 12, 11, or 0 row punches.

APPENDIX

ACCESS Data Collection Form . . . . . A

Master Payroll Coding Sheet . . . . . B

ACCESS Educational Data Processing Cards C

Student Schedule Form . . . . . D

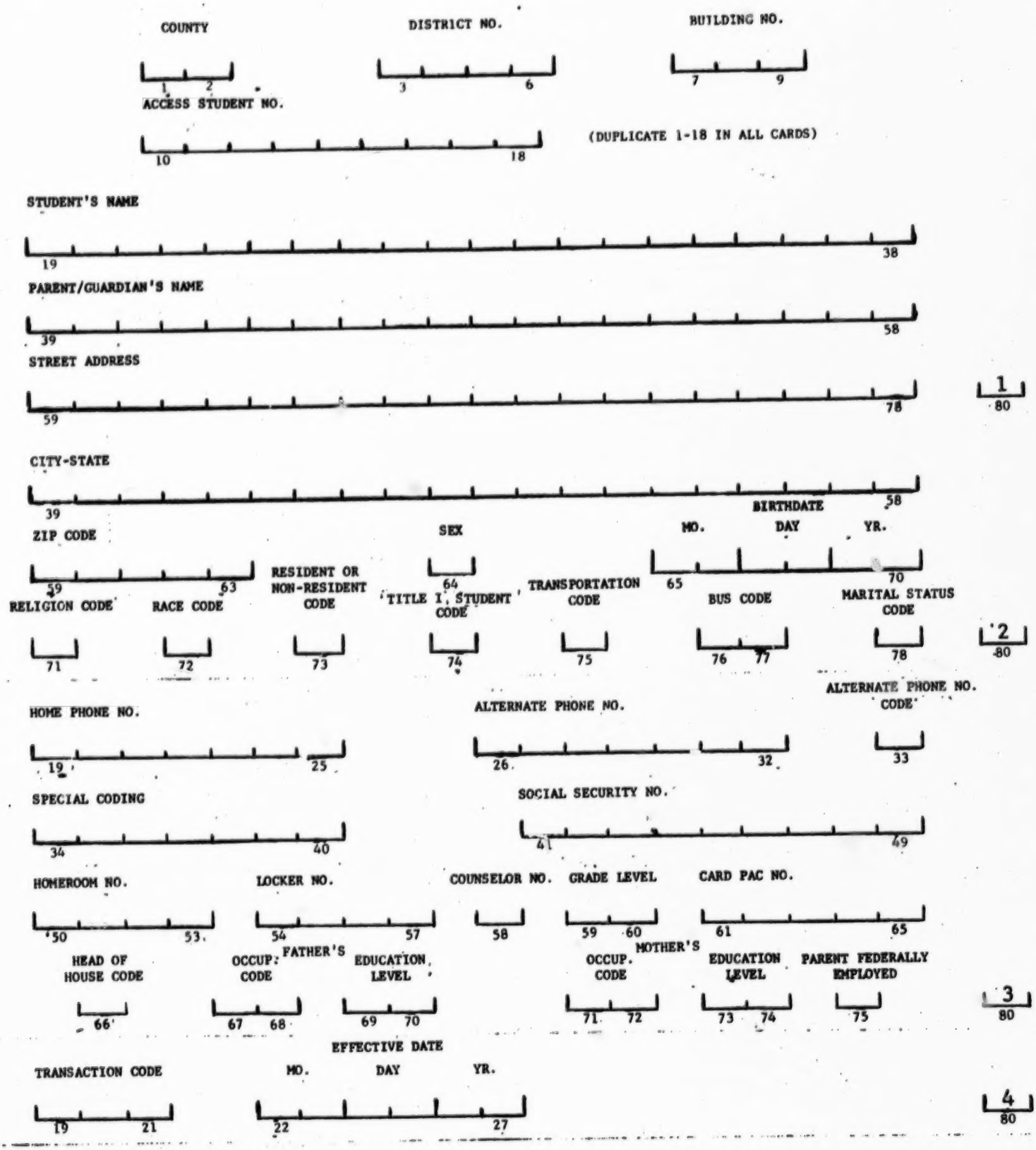
Student Class Record . . . . . E

Student Mark and Attendance Record . . . . . F

Appendix A

ACCESS DATA COLLECTION FORM

PLEASE PRINT ALL INFORMATION



PLEASE PRINT ALL INFORMATION

COUNTY (1–2)

DISTRICT NO. (3–6)

BUILDING NO. (7–9)

ACCESS STUDENT NO. (10–18)

(DUPLICATE 1-18 IN ALL CARDS)

PER	SEM	DAYS MET	ROOM.	COURSE TITLE	COURSE NO.	SECT	INSTR. NO.	INSTRUCTORS NAME.
19-20	21	22 25	26 29	30 39	40 43	44-45	46 48	49 58

Appendix B

MASTER PAYROLL CODING SHEET

District Name _____

	New Employee
	Employee Info Change
	Terminate

District 86 Number

Building 87 Number

Employee 88 Number

Effective Date

	No IPERS
	Student
	Other Than Monthly Pay

EMPLOYEE INFORMATION

OTHER (Comments):

Name 01 (First / Initial / Last)

Address 02 (Street Address)

Address 03 (City / State / Zip)

Marital Status 04
1 = single
2 = married

Dep. Claimed Fed. Withhold 05

Dep. Claimed State Withhold 06

Social Security 89

EMPLOYEE CURRENT EARNINGS INFORMATION

Gross Pay 12

Acct. No. 07

Gross 2 13

Acct. No. 2 08

Gross 3 14

Acct. No. 3 09

Gross 4 15

Acct. No. 4 10

Gross 5 16

Acct. No. 5 11

Hours Wkd. 17

Hourly Emp rate 18

Sick 84 Lv Bal

Sick Lv Used 19

Ins #1 20

Ins #2 21

TSA 22

Prof Dues 23

Bonds 24

Other 1 25

Other 2 26

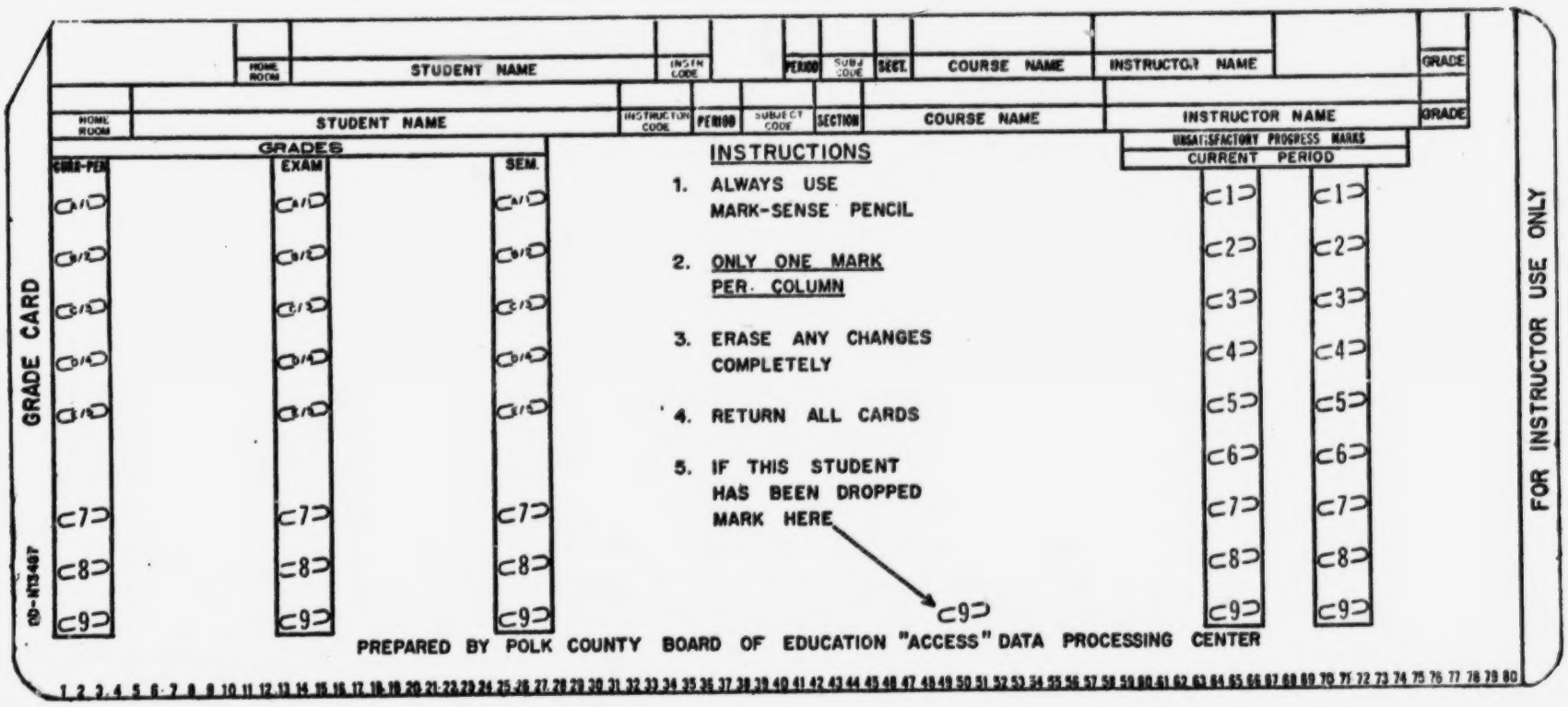
Employee Year to Date Information

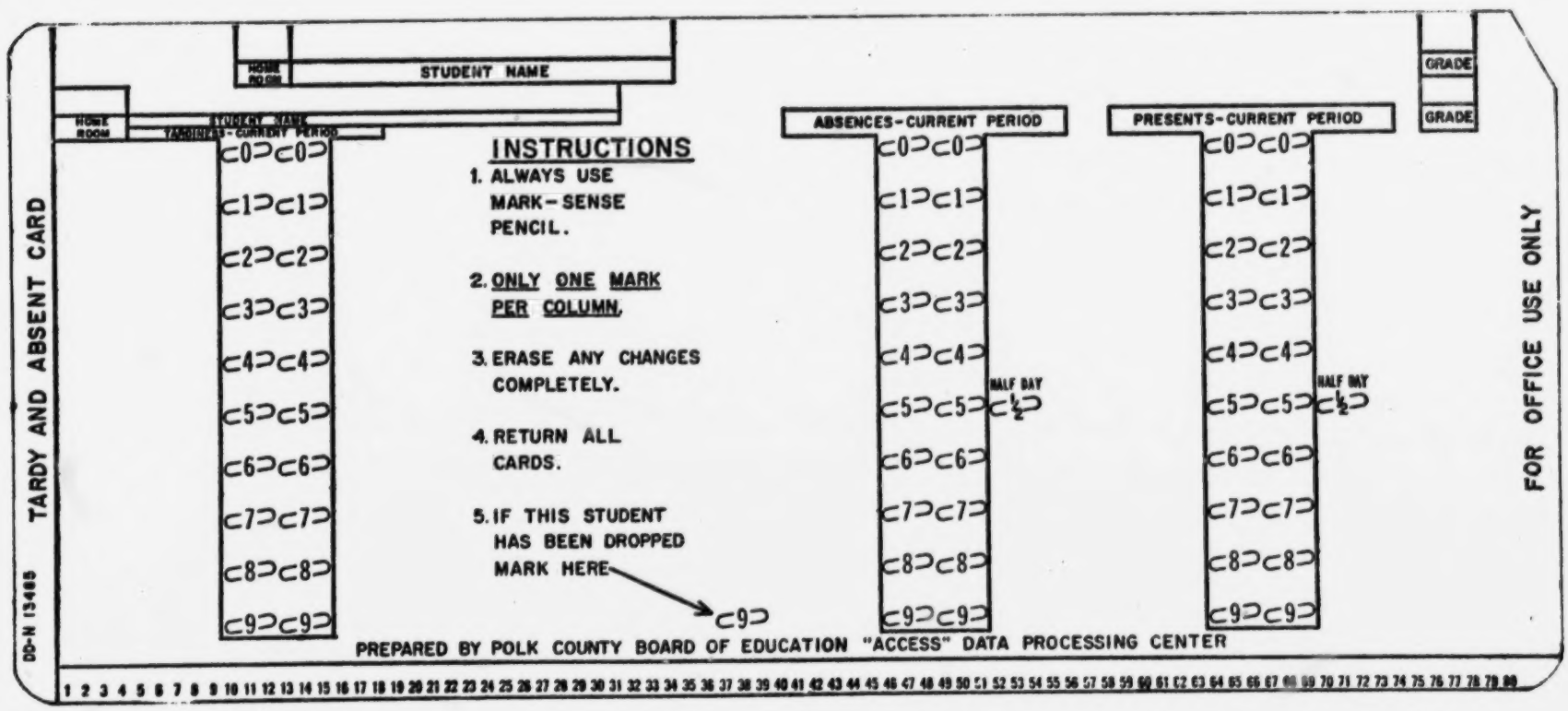
Gross Pay	32		Acct. No.		
Gross 2	33		Acct. No. 2		
Gross 3	34		Acct. No. 3		
Gross 4	35		Acct. No. 4		
Gross 5	36		Acct. No. 5		
Federal Withholding	37		State Withholding	38	
FICA	39		IPERS	40	
INS 1	41		INS 2	42	
TSA	43		PROF DUES	44	
BONDS	45		OTHER 1	46	
OTHER 2	47				
NET PAY	48				

Employee Quarter to Date Information (Not to be Used by School District)

GROSS	50				
FICA	57		IPERS	58	

Appendix C


GRADE CARD
FOR INSTRUCTOR USE ONLY
HOME ROOM
STUDENT NAME
INSTR CODE
PERIOD
SUBJ CODE
SECT.
COURSE NAME
INSTRUCTOR NAME
GRADE
GRADES
QUAR-PER
EXAM
SEM.
INSTRUCTIONS
1. ALWAYS USE MARK-SENSE PENCIL
2. ONLY ONE MARK PER COLUMN
3. ERASE ANY CHANGES COMPLETELY
4. RETURN ALL CARDS
5. IF THIS STUDENT HAS BEEN DROPPED MARK HERE
UNSATISFACTORY PROGRESS MARKS
CURRENT PERIOD
PREPARED BY POLK COUNTY BOARD OF EDUCATION "ACCESS" DATA PROCESSING CENTER


TARDY AND ABSENT CARD
FOR OFFICE USE ONLY
HOME ROOM
STUDENT NAME
TARDINESS - CURRENT PERIOD
GRADE
INSTRUCTIONS
1. ALWAYS USE MARK-SENSE PENCIL.
2. ONLY ONE MARK PER COLUMN.
3. ERASE ANY CHANGES COMPLETELY.
4. RETURN ALL CARDS.
5. IF THIS STUDENT HAS BEEN DROPPED MARK HERE
ABSENCES - CURRENT PERIOD
PRESENTS - CURRENT PERIOD
HALF DAY
PREPARED BY POLK COUNTY BOARD OF EDUCATION "ACCESS" DATA PROCESSING CENTER

Appendix D

SCHOOL IDENTIFICATION / NAME					STUDENT'S NAME		DATE
HOME ROOM	GRADE LEVEL	SEMESTER	SEX	BIRTH DATE	COUNSELOR'S NAME		ACCESS STUDENT NO.

PERIOD	SEM.	DAYS MET	ROOM	COURSE TITLE	COURSE NO.	SECT.	INSTRUCTOR	REMARKS

STUDENT SCHEDULE

PREPARED BY AREA XI ACCESS DATA CENTER

PARENT NAME AND ADDRESS	HOME PHONE	HOME ROOM	LOCKER NO.	GR. LEV	ALTERNATE PHONE
	STUDENT'S NAME				

SCHOOL IDENTIFICATION / NAME					STUDENT'S NAME		DATE
HOME ROOM	GRADE LEVEL	SEMESTER	SEX	BIRTH DATE	COUNSELOR'S NAME		ACCESS STUDENT NO.

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STUDENT SCHEDULE

PREPARED BY AREA XI ACCESS DATA CENTER

PARENT NAME AND ADDRESS	HOME PHONE	HOME ROOM	LOCKER NO.	GR. LEV	ALTERNATE PHONE
	STUDENT'S NAME				

Appendix E

CLASS RECORD

COURSE TITLE | COURSE NO. | SECT. NO. | DATE

SCHOOL CODE | DAYS MET | SEM | PERIOD | INSTRUCTOR'S NAME

GR LEV	STUDENT NAME	NUMBER	HOMEROOM	GRADES					COMMENTS		
				1	2	3	EXAM	SEM	1	2	3

Appendix F

STUDENT NO.	SEX

GRADE REPORT OF

HOME ROOM	GRADE	SEM.

DAYS TARDY	DAYS ABSENT

SCHOOL YEAR

GRADING SYSTEM

1/A - SUPERIOR
2/B - ABOVE AVERAGE
3/C - AVERAGE
4/D - BELOW AVERAGE
5/F - NO CREDIT
7 - CONDITIONAL GRADE
8 - EXCUSED
9 - INCOMPLETE

SUBJECT	INSTRUCTOR	PERIOD GRADES 1st SEMESTER 1	2	3	EXAM.	SEM.	2nd SEMESTER 1	2	3	EXAM.	SEM.

INSTRUCTOR COMMENTS * NUMBERS INDICATE REMARKS. 1st SEMESTER 1	2	3	2nd SEMESTER 1	2	3

* REMARKS

1. Absent too much from this class.
2. Showing improvement.
3. Low scores on tests.
4. Lack of interest in subject.
5. Inattention in class.
6. Does not complete work fully and on time.
7. Does not participate in class activities.
8. Appears to be working to capacity.
9. Parents should confer with the teacher.